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DISEASES OF THE NERVOUS SYSTEM

A PRACTICAL JOURNAL ON PSYCHIATRY AND NEUROLOGY

PUBLISHED MONTHLY for the PHYSICIAN in the GENERAL PRACTICE of MEDICINE

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DISEASES of the NERVOUS SYSTEM

(PUBLISHED MONTHLY)

A PRACTICAL JOURNAL ON PSYCHIATRY AND NEUROLOGY

EDITORIAL COMMENT

Psychobiology

Out of the wilderness of conflicting psychological theories, which are not suitable for practical use by the general practitioner, because of technical jargon and elusive concepts, there has developed an approach to mental and emotional problems which is generally useful. This view psychobiology, (named and promulgated by Adolf Meyer and his associates) may be defined as a pluralistic, empiric approach, utilizing genetic-dynamic methods, to the study and treatment on all levels of the whole man with his activities as an integrated individual.

The growth and development of an individual is studied as an integrated whole, as he is seen in actual life, not only as a physical person, but as a participating member of a group and a part of nature. This approach has received a wide acceptance in the medical schools and among practitioners in the treatment of nervous and mental diseases because of its practicability; its freedom from mystical concepts; its acceptance of what is best from all "schools" of thought; and its lack of one sided or esateric explanations.

Psychobiology regards mental illness as the gradual cumulative result of unhealthy reactions of the individual to the demands of his environment. All factors, somatogenic, neurogenic, exogenic, psychogenic, and constitutional are studied for their part in the production of the illness. This multiplicity of factors actually and potentially at work in a person is evaluated in an attempt to improve the assets of the patient as well as to eradicate his difficulties. As simple a vocabulary as possible is employed in describing the actual conditions found, the motivations causing them and the therapy. It is a method which can be taught and learned like any other scientific discipline; it is not a mystical art known only to a few initiates. The medical man can now treat mental and emotional disorders just as he has in the past with the advantage of a technique which is a potent instrument for diagnosis and treatment and which forms a sound basis for the understanding of so-called mental problems.

This method, based on the belief that everything which goes to make up a man may be important in the causation of his illness, including his endowments, training, wife and children, job, bank account, hopes, fears and ideals, attempts to sift out all the pertinent facts in an illness. A fact is regarded as "anything which makes a difference" to the patient.

After thorough physical, neurological, and laboratory studies have been made to rule out somatic causation, the complaint of the patient is studied in great detail as the central fact of the illness. While most other disciplines neglect this in favor of probing, it is paramount to remember that it is the complaint which brings the patient to the doctor and the efficacy of the treatment may in some measure be judged by the improvement noted in the complaint.

The relation of the complaint to all activities of the patient is carefully evaluated, including the vital biological activities, familial, religious, occupational interests and any special pathological features which may present themselves. Then the evolution of the problem is gradually elucidated by adequate inquiry into the history of the past perform-

(Continued on Page 63)

WITH OUR CONTRIBUTORS

DR. TEMPLE FAY

Dr. Fay, whose paper dealt with *Cerebral Localization by Means of Percussion and Ausculation,* received his M. D. degree from the University of Pennsylvania School of Medicine in 1921. Since that time he has been connected with the University in eight different departments as instructor and associate. At present, he is the professor and head of the Departments of Neurology and Neurosurgery of Temple University Medical School. Dr. Fay is affiliated with some fifteen medical societies, holding the offices of Regent for the International College of Surgeons; Vice-President for the International League Against Epilepsy; and Regional Director of the State of Pennsylvania for the Pan-American Medical Association. In 1929, he was the recipient of the Gold Medal Award, Class A, Scientific Exhibit of the American Medical Association and, in 1935, he received the Special Award of Merit from the same organization.

DR. EXUM WALKER

Dr. Walker, author of *Sciatica—Its Cause and Treatment,* received his M. D. degree from Emory University. Seven years of interneships and affiliations with some five teaching institutions constituted his basic training in Neurosurgery. He has been on the faculty of Cornell, Yale, Columbia and McGill Universities and, at present, is connected with Emory University. He is a member of the Academy of Neurosurgery and is a Fellow of the Southeastern Surgical Congress.

DR. ABRAHAM MYERSON

Dr. Myerson, author of *The Social Psychology of Alcoholism,* qualifies as an expert on this subject, being an Associate Editor of the *American Journal of Alcoholism,* and a member of the Research Council on Problems of Alcohol. Also, he holds professorships at Harvard Medical School and Tufts College Medical School; consultancies in Neurology or Psychiatry, or both, at six hospitals; and the chairmanship of the State Research Committee of the Department of Mental Health for the Commonwealth of Massachusetts. Dr. Myerson is fifty-eight years old and has worked in the fields of research, lecturing, teaching, consultation in neurology and psychiatry, and writing. The last field of endeavor has produced seven books and an innumerable quantity of magazine articles.

DR. MABEL G. MASTEN

Dr. Masten, who reported on seven cases of *Polyneuritis of Pregnancy,* received her medical degree from Rush Medical College in 1925. She followed this with an interneship and residency in Neuropsychiatry at the Wisconsin General Hospital. At present, she is an Associate Professor of Neuropsychiatry at Wisconsin Medical School and Medical Director of the Mental Hygiene Clinic of Madison Public Schools. She is certified by the American Board in Neuro-psychiatry and is affiliated with the A.M A., the Chicago Neurological Society, and the Central Neuropsychiatric Association.

DR. EUGENE DAVIDOFF

Dr. Davidoff, one of the co-authors of the paper on *Psychiatric Aspects of Amphetamine Sulfate Therapy,* was born in 1901 and graduated from the Iowa University College of Medicine in 1927. At the present time, he is Assistant Professor of Psychiatry at the Syracuse University College of Medicine and the Senior Clinical Psychiatrist of the Syracuse Psychopathic Hospital. He is affiliated with four of the outstanding medical societies of the country, among them the American Psychiatric Association and a branch of the American Board of Psychiatry. His writings include studies on amphetamine sulfate, traumatic and alcoholic psychoses, psychoneuroses and somatic disease and juvenile delinquency.

DR. EDWARD C. REIFENSTEIN,JR.

Dr. Reifenstein, the other co-author of the paper dealing with Amphetamine Sulfate, has been studying the drug since 1936, and during this time he has published over a dozen papers on the subject. He was born in 1908 and received his M. D. degree from Syracuse University College of Medicine in 1934. He is a member of many medical fraternities and an associate editor of *The Centaur.* His chief interests lie in the field of internal medicine, particularly in endocrinology and neuro-psychiatry. At the present time, he is a consulting clinic physician at the Syracuse Psychopathic Hospital; the Resident Medical Physician of the Syracuse University Free Dispensary; and an instructor in Medicine and Psychiatry for the University College of Medicine.

Cerebral Localization by Means of Percussion and Auscultation

TEMPLE FAY, M. D., F.A.C.S.*
Philadelphia, Pennsylvania

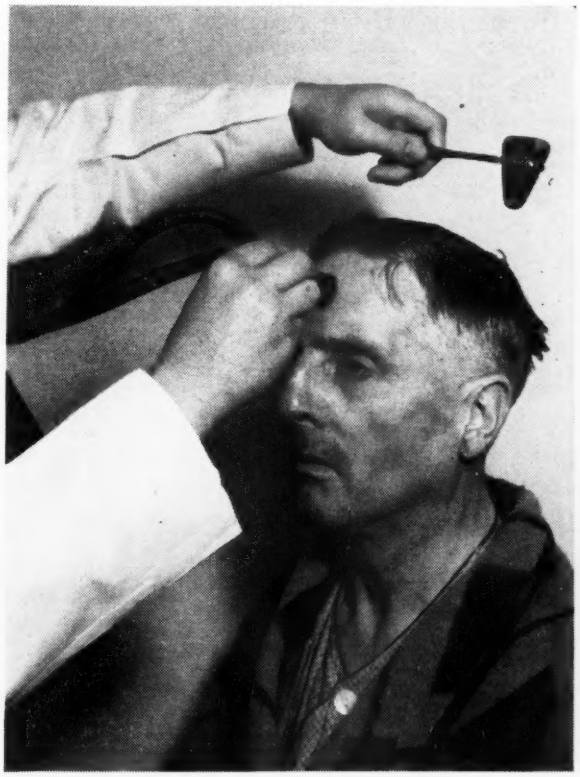
The value of percussion of the head in fractures of the skull has long been known. The use of the stethoscope and reflex hammer, as a means of detecting changes of note in percussion of the skull for localization of intracranial lesions, has been practiced in the Neurosurgical Clinic at Temple University Hospital, for the past eleven years. During this time it has been found to be one of the outstandingly reliable sources of information for localization of intracranial lesions, with sufficient confirmation by operation and x-ray to advocate its wider use and application.

Localized subdural hemorrhage, abscess, brain tumors near the surface of the hemisphere, areas of cerebral thrombosis and edema, as well as phases of increased intracranial pressure and hydrocephalus are easily detectable to the trained ear. Localized mass lesions can be outlined with a degree of accuracy which is almost equal to the encephalographic portrayal. Following hemiplegia, the zone of involvement can be frequently mapped out and the progress of the resultant edema noted by this method.

The clinician must first familiarize himself with the peculiar sound responses obtained from the head of the normal individual, when the bell of the stethoscope is placed over the midline of the forehead and the reflex hammer lightly tapped over the head. The quantity of hair, the thickness of the temporal muscles and the density of bone around the Petron are recognizable variations found in the normal.

In the pathological case, corresponding areas are compared on each side of the head by tapping with just sufficient force to allow a slight rebound of the hammer from the scalp. A stroke of "one, two, three" "one, two, three" is most desirable. Superficial lesions can be picked up and demarcated by the varying intensity of sound transmitted to the stethoscope by each blow. When localized lesions exist, local tenderness can be elicited, in the majority of cases, directly over the zone of "dullness" or a definite change of note.

For deeper lesions, such as non-encapsulated gliomas, diffuse local cerebritis and intracapsular hemorrhage, the stroke of the hammer should be varied, always striking the head perpendicularly to the arc of the skull, so as to give a r a p i d "rat-tat-tat" or "B-r-r-r-r-r" effect. This can be done by striking the scalp and holding the hammer down against the rebound of the rubber point, so that a series of diminishing contacts will be made. This gives the effect of a diminishing vibration and, when practiced and accomplished, a change of note in the deeper structures can be d e t e c t e d after some practice.



I have attempted to obtain from the leaders in the field of medical auscultation descriptive words for this sound, as picked up by

* Professor and Head of the Departments of Neurology and Neurosurgery, Temple University School of Medicine, Philadelphia.

the stethoscope on the forehead. There is apparently no agreement as to the proper adjectives to apply to this phenomenon, nor is it possible to describe the quality of "dullness", "flatness" and the altered changes of note found in each instance.

The practiced ear, alone, can detect these differences when this test is applied properly and the clinician must evolve for himself the knowledge of "normal" responses and the gradual development of characteristic changes found in the various lesions encountered. The technique is not difficult to master and will repay the clinician's efforts by supporting his diagnosis.

Increased intracranial pressure, hydrocephalus and subdural fluid ("wet brain") give rise to an universally "higher pitched" note than normal and the transmission of sound is almost as great in the occipital area as it is around the bell of the stethoscope, so that not only is the note quite characteristic, but its universal transmission helps to indicate the presence of abnormal collections of fluid which are apparently responsible for the maintenance of the sound transmission to a greater degree than is found in the normal.

In our experience, x-ray, encephalographic and operative verification of the phenomena has been obtained in more than ninety per cent of the patients examined.

The test has become of particular importance, if positive, when clinical signs of localization have not been "clear cut" and yet, general signs of intracranial pathology are clinically evident

3401 N. Broad St.

Sciatica–Its Cause and Treatment

EXUM WALKER, M.D. *
Atlanta, Georgia

Herniation of an intervertebral disc has been known for several years to be a common cause of sciatica. The relief following operative removal in these cases has been remarkable, but until recently there still remained a large percentage of cases of sciatica in which no lesion could be demonstrated, so the cause of the pain in these cases remained a mystery. Encouraged by the dramatic relief in the cases where a lesion was localized and removed, attention has been focused on the cause of the sciatic pain in the cases where no lesion could be found. More recently, with increasing experience and by careful consideration of each case, it has been possible to make a positive diagnosis in practically every case.

There are many pathological conditions capable of causing sciatica, but the mechanism in each is essentially the same. The common factor in most instances is mechanical compression of the spinal nerve roots within the spinal canal. This produces a definite syndrome, and a fairly accurate anatomical diagnosis can be made by simple physical examination alone. The pathological nature of the lesion may be suggested by the history of the case and subsequently proven by special x-ray studies.

For a clearer understanding of these cases, it would be well to consider first the formation of the sciatic nerve. The sciatic nerve has its origin from the fourth and fifth lumbar and first, second and third sacral spinal nerve roots. These roots emerge from the spinal cord opposite the 12th thoracic and first lumbar vertebrae and course down the spinal canal and leave separately through their respective intervertebral and anterior sacral formanina. These nerve roots join in front of the sacrum to form the sciatic trunk, which passes down the posterior aspect of the thigh, innervating the structures of the gluteal region, the posterior half of the thigh, and the leg and foot below the knee. It at once becomes apparent that pain in the distribution of the sciatic nerve might be caused by a lesion at any point from the origin of the spinal nerve roots from the spinal cord to their ultimate regions of distribution. Also, if considered from an anatomical and physiological standpoint, one would expect clinical findings to vary, de-

* From the Department of Surgery (Neuro), Emory University School of Medicine.

pending on the location of the lesion. This is exactly true, for in most cases the lesion can be localized by careful clinical examination. It has been found that in a large majority of the patients suffering from sciatica, the lesion is in the lower portion of the spinal canal.

Since herniation of the fourth or fifth lumbar intervertebral disc is the most common lesion encountered, the manner in which this lesion produces the sciatic syndrome will be discussed in some detail.

The diagrams (see figure 1) show how the nerve roots are compressed.

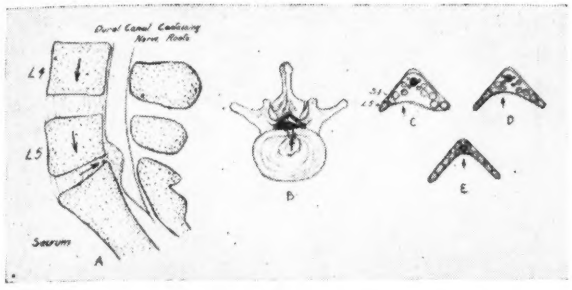


Fig. 1: A and B show how the spinal nerve roots are compressed by a herniation of an intervertebral disc. C, D and E diagramatically show how the nerve roots are compressed in turn, as the herniation of the disc increased. Notice that the nerve roots in one angle and then those in the opposite angle are compressed before the nerve roots in the center. This explains the mechanism by which the neurological signs and symptoms are produced in cases presenting the sciatic syndrome.

If a nerve root is compressed, it responds to the mechanical irritation by an inflammatory reaction essentially similar to that in other tissues. The nerve root becomes swollen from edema and there are areas of cellular infiltration, particularly in the perivascular spaces. All stages of inflammation may be present and demonstrable by the type of cellular infiltration. If the nerve root compression is prolonged, actual degeneration of the nerve elements occurs.

Figure 1 shows how the nerve roots are compressed in turn as the size of the herniation advances. Most of these lesions begin to one side of the midline, so that the pain tends to be limited to one side at the onset, but may involve both sides as the lesion enlarges.

Keeping the above information in mind, the explanation of the signs and symptoms that these patients present will be clear.

The history is usually that of onset of pain in the lower part of the back or above one sacroiliac region. Then or sometime later there may occur radiation of pain into the hip or down the posterior part of the thigh into the leg or foot, depending upon which nerve roots are involved. Reference to a sensory chart showing nerve root distribution will be helpful. It must be remembered, however, that this chart does not show the innervation of the deep structures. Also there is considerable overlaping in the areas supplied by adjacent nerve roots.

A definite history of heavy lifting, twisting the body, or injury has been obtained in over half the cases in this series. Some have no history of strenuous activities. A few have had herniation of the disc occur during muscular relaxation while in bed.

The intensity of the pain is apt to have a definite relationship to activities which entail motion of the spine. In many cases coughing and sneezing increase the pain. There is a tendency toward spontaneous remissions. Indeed, in many patients pain occurs in definite cycles; increased physical activity leading to incapacitating pain, and enforced inactivity leading to recovery.

Spasm of the spinal muscles may occur as a protective mechanism. This lessens the pain by splinting the spine in an optimum position where the nerve root compression will be at a minimum. The "poker spine" and the listing that some patients have are the result of this protective muscle splinting. Also as a result of the chronic muscle spasm, there occurs secondary aching and tenderness extending for a considerable distance along the sacro-spinalis muscle groups.

Almost invariably present is tenderness to firm palpation between, or just to one side of the fourth and fifth lumbar or fifth lumbar and first sacral spinous processes. Often pain can be caused to radiate into the hip or leg reproducing the pattern which the patient has been having. This is a very important physical finding, as it is caused by direct pressure against the nerve roots at the site of the lesion. The pressure is transmitted deeply through the ligamentum flavum, which bridges the interspace between the laminal arches, forming the roof of the spinal canal at this level. This point tenderness being so

near the upper margin of the sacroiliac joint is probably why "sacro-iliac strain" was so often diagnosed in the past. With the recent evidence at hand it seems probable that there is no such lesion as sacroiliac strain, or at least that it has been diagnosed far too often.

Reproduction of pain on straight leg raising is also a fairly constant finding. This maneuver causes compression of the nerve roots by increasing the bulging of the intervertebral disc into the canal.

The neurological findings are the direct result of nerve root irritation or degeneration and in each instance will depend on which nerve roots are affected.

The reflex changes are very important in diagnosis. The ankle jerks, being mediated through the fifth lumbar and first sacral nerve roots, are most often affected. Early inflammatory reaction in the nerve roots will reflexes will be diminished or absent as the cause the reflexes to be hyperactive. After nerve root degeneration has taken place, the reflex arc is interrupted. The knee jerks are usually not affected, but when they are they are more apt to be slightly hyperactive, though they are sometimes diminished or absent.

Sensory changes will be found if there is much nerve root damage. Occasionally there may be areas of hyperesthesia, though there is more often diminished sensation as demonstrated with a pin or wisp of cotton. The greatest loss is usually in the region of the fifth lumbar or first sacral distribution, sensory loss becoming progressively less as the fifth sacral distribution is approached. Reference to charts showing the nerve root distribution will be very helpful to those not familiar with neurological examinations. For practical purposes, the outer side of the foot is the area where the sensory loss is greatest in most cases of sciatica.

Atrophy of muscle groups and even weakness may occur if the lesion has been longstanding. The gluteal, hamstring, and calf groups may be involved. Wasting of one calf may be demonstrated with a tape measure if the difference is not apparent on casual inspection. If there is active degeneration, fibrillary twitching of the muscle may be seen.

In most cases of sciatica, the offending lesion is small and the neurological findings are consequently not marked. Not uncommonly, though, the lesion is large, completely blocking the spinal canal. Indeed, there may be complete paralysis and sensory loss with bladder and rectal incontinence. By then the patient has lost his classification as a case of sciatica and is readily referred to the neurosurgeon as a case of "paraplegia"—often too late!

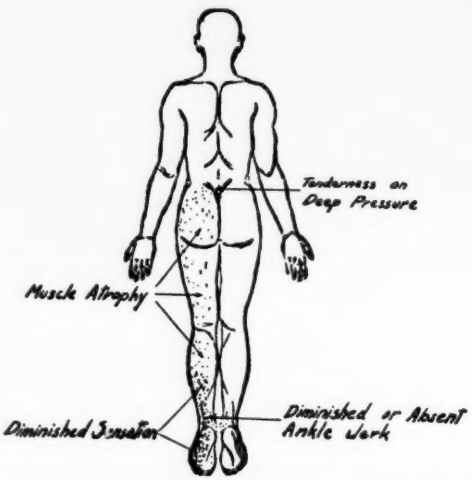


Fig. 2: Diagram showing the important findings in a typical case presenting the sciatic syndrome due to unilateral spinal nerve root compression. As the lesion advances, the same findings appear on the opposite side.

Frequently, the protein content of the spinal fluid is increased, but not necessarily so. Earlier it was thought that the protein content was increased in every case, and this test was used as a positive indication for carrying out lipiodol studies. We now realize that this is not true, as we have seen many cases with a normal protein content in the spinal fluid where intraspinal lesions were demonstrated.

Plain x-ray films of the spine have shown nothing upon which a diagnosis could be made in most cases. A scoliosis or "poker spine", increased lumbo-sacral angle, or a narrowing of the intervertebral disc are suggestive findings, but not diagnostic. Occasionally, a metastatic tumor or an old fracture may be found.

A positive diagnosis can be made by special x-ray studies which outline the spinal canal. Lipiodol is injected into the subarachnoid space and its excursion along the canal is observed under the fluoroscope. The lesion causes an indenture in the dural canal which

is seen as a defect when the lipiodol flows past the lesion. The defects caused by the large lesions are easily seen. (See figure 3.)

There are many lesions other than herniation of an intervertebral disc which can produce the sciatic syndrome, but the mechanism

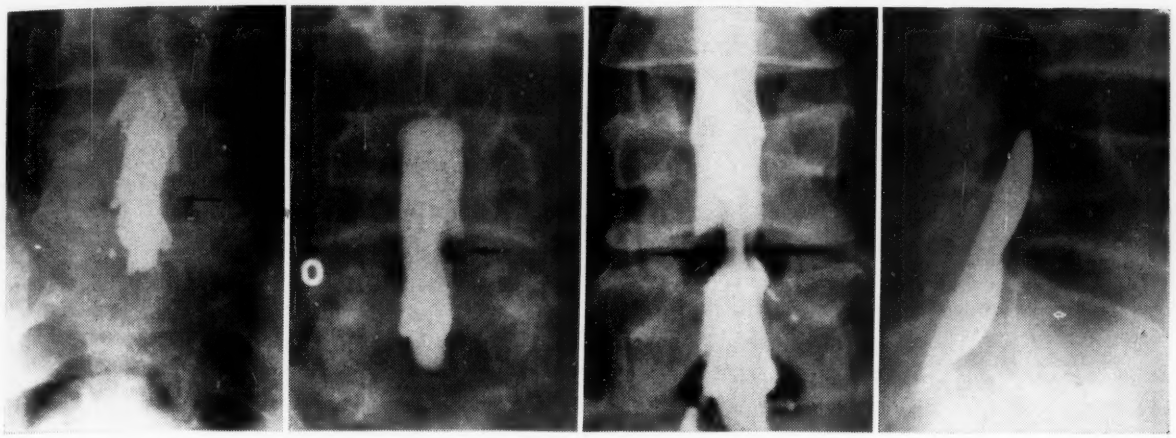


Fig. 3: Typical defects in the spinal canal caused by herniations of intervertebral discs as shown with lipiodol.

Some of the smaller lesions require considerable familiarity with this type of x-ray interpretation. We have had occasion to re-examine some of our earlier cases and, because of our increased experience, have been able to demonstrate positive lesions which were not recognized at first.

In our last twenty cases we have used air in the spinal canal instead of lipiodol. (See figure 4.) This does not show the outline of the canal as well as lipiodol, but is sufficient for positive diagnosis in about eighty per cent of cases. It is our custom now to reserve the use of lipiodol for the small group of cases in which a diagnosis cannot be proven with air alone.

in most instances is essentially the same; that is, mechanical compression of the spinal nerve roots. Hypertrophy of the ligamentum flavum, old fractures of the vertebrae, tumors of the spine or nerve roots, spondylolisthesis and other rarer conditions have been encountered. Lesions of the disc vary from a slight abnormal degree of bulging into the canal to a complete rupture with extrusion of the disc substance into the spinal canal.

Herniation of the intervertebral disc is an exceedingly common lesion. It is probable that most of us have had at one time or another slight and usually unrecognized symptoms of spinal nerve root compression. One needs but to examine the spine of a

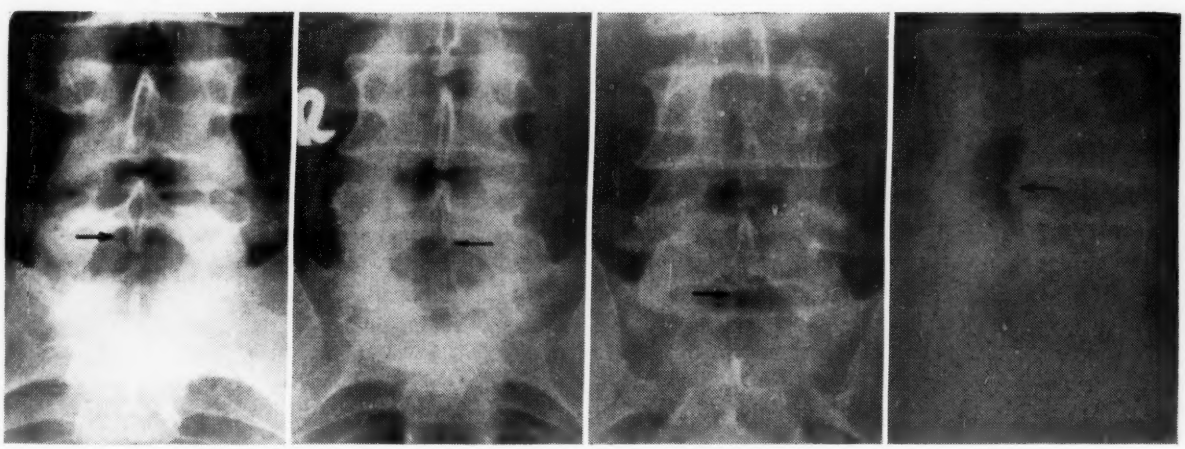


Fig. 4: Typical defects in the spinal canal caused by herniations of intervertebral discs as shown with air.

human skeleton to see that it is designed to support weight in a horizontal position. In the quadrupeds the body weight is distributed between the forelimbs and the hindlimbs. Also, nature did not allow for the carrying of heavy weights or the physical stress which is imposed on so many of us today. As we phylogenetically became bipeds and began to walk erect, our spines underwent compensatory changes. The lumbar curve became much exaggerated and the articulations between the vertebrae were then obviously at an architectural disadvantage. In addition, the weight of the trunk, head, and forelimbs became dependent on the lumbo-sacral region for support. In an attempt to adapt its function to these changes, the spine has become more rigid at the expense of flexibility. As a result of these changes, the caliber of the lower spinal canal has become diminished and the nerve roots do not lie as freely as they should, particularly in the lateral angles of the canal. Also, with the added load on the lumbo-sacral region, an intervertebral disc is more apt to bulge excessively into the spinal canal, or actually rupture and extrude its substance into the canal. It is no wonder we have so much backache and sciatica.

The proper management of these cases depends upon the severity of the symptoms observed. Conservative treatment should always be tried first, since there is a natural tendency toward recovery. Rest in bed is often sufficient. A cast for complete immobilization would be theoretically the correct treatment, though few patients will tolerate such immobilization as many have an irresistable desire to change their position constantly.

For the patients who do not respond to conservative treatment, surgery is indicated. This consists of the removal of the offending pathological lesion and adequately decompressing the compressed nerve roots. This is, of course, not accomplished by any standardized procedure, but must be performed individually in accordance with the existing pathology. It has never been necessary to fuse the spine or apply a cast in any of our cases—thus convalescence has not been prolonged.

In our personal experience of more than a hundred cases, the results from operative treatment have been very gratifying. In most patients who were suffering from acute pain, the relief would be dramatic. In other cases, the relief would be less dramatic, but the pain would be greatly diminished immediately, followed by progressive improvement.

Summary

In summary, it may be stated that most cases of low back pain and sciatica are due to compression of the spinal nerve roots by a mechanical lesion. The most common lesion is an excessive bulging or actual rupture of an intervertebral disc. Other less common lesions have been encountered. The diagnosis can be made in most instances from clinical examination alone. The diagnosis can be proven by special x-ray studies, which outline the spinal canal.

The lesion can be demonstrated at operation, and following its correction the patient is relieved of his pain.

NEWSNOTES

MENTAL HYGIENE SOCIETY OF VIRGINIA MEETS

Dr. David C. Wilson, professor of psychiatry at the University of Virginia addressed the meeting of the Mental Hygiene Society of Virginia at Richmond, Virginia, on January 15th. Dr. Wilson discussed a "State Hospital System which Cannot be Influenced by Politics." Dr. O. B. Darden, Richmond, Virginia, was elected president of the society. Dr. Winifred Overholser, Washington, D. C., made the closing address.

LOS ANGELES SOCIETY OF NEUROLOGY AND PSYCHIATRY HOLDS MEETING

The Los Angeles Society of Neurology and Psychiatry held a regular meeting at the Los Angeles County Medical Building on January 17th. Dr. May E. Romm discussed "Notes on a Case of Exhibitionism in the Male"; and Dr. Leo J. Adelstein read a paper entitled, "Neurological Divining Rods and Their Localizing Value".

The Social Psychology of Alcoholism *

ABRAHAM MYERSON, M.D. **
Boston, Massachusetts

Probably the discovery that fruits and cereals, when they fermented through the processes incidental to rotting, produced a substance of potent effect on the mind and the mood of man, was accidental. This discovery undoubtedly took place very distantly in time and perhaps simultaneously in many places, and thus was born the use of alcohol. So alcohol enters into the history of every civilization as a force which has probably profoundly influenced the fate of mankind. The twin facts, that grapes, apples, berries spontaneously change through a process later to be called fermentation into alcohol and sugar and can be imbibed in the form of wines, and that cereals can be brought by similar changes into beers and ales transformed man into an alcohol-using and abusing animal.

Law of Demand and Supply

Wherever there is an urgent human demand, there is built up a human industry which fulfills it. If the demand is for illicit sexual relationships, prostitutes come into being. If there is a demand for alcohol, science and art both build up its production, and custom and business take care of its use and distribution. The naive discovery gave way, as it always does, to organized production. Distillation finally came into being. Fortunes were made in the production and distribution of alcoholic beverages, because once its effects became known to man, it became incorporated in a way no other drug or chemical has ever paralleled or in the least approached into the customs and organized habits of mankind.

Human Ambivalence and Alcohol

Man has shown a very interesting ambivalence in respect to his pleasures, satisfactions and sensual enjoyments. Natively, he pursues sensuality and voluptuousness, seeks ardently to gratify and to develop the pleasures of the gastrointestinal tract and of the sexual organs. This develops into voluptuousness, epicureanism, and connoisseurship. On the other hand and in sharp contrast, he has built up a hatred of pleasure which develops into asceticism and renunciation, an asceticism which fiercely denounces the joys of the flesh, including the pleasures of alcohol. These struggles create an ambivalence; in fact, they *are* an ambivalence in respect to pleasure and sensuality, including thus the use of alcohol. The middle way, wherein pleasure and satisfaction are kept in harmony with the organized purposes of the individual is known as temperance, which is fundamentally the road to wisdom.

The main grip of alcohol on man lies in its ability to change mood and personality. Its use has become a source of sociality, and has become an integral part of ceremonials, as well as the main highway towards the formalizing and informalizing of human relationships. Its uses run from the toast, the pledge, the binding of the contract, the participation in the divine, to the breaking down of inhibition and the culmination of excited desire into orgy. The escape from inhibition, from inferiority, from fatigue and sorrow, which it temporarily brings about, exemplifies the organic nature of the mind and mood of man and is the source of the peril of its use to the human being, since its main danger lies in its disorganization of character and personality. People are not made "tight" by alcohol; they are made "loose". The loosening process may seem good; in its extreme form it is disorganization. The orgy stands on one side of the needs of man; the disciplined, orderly life is the other extreme.

Wherever men get together as good fellows, they sing songs praising the use of alcohol. Thus, it has become synonymous with pleasure and good fellowship and, as surely as it is a way of escape, it springs from exuberance, to use Leo Alexander's phrase.

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*Read at the twenty-ninth annual meeting of the American Psychopathological Association, June 5, 1939, held in Atlantic City, N. J.

**From the Division of Research, Boston State Hospital, Boston, Mass., aided by grants from the Commonwealth of Massachusetts and the Rockefeller Foundation.

Wine, women and song are three avenues of sensuality, and thus alcohol has become a road not only to the changes in mood, which it itself brings about, but a means by which man can enjoy more fully woman and song. But mingling with the praise of alcohol and its extolment as a means of producing good fellowship and of linking more closely together discordant human beings are the notes of stern disapproval, of hatred, and of condemnation of the drug.

The alcoholic is thus situated at the focus of two opposing sets of forces, one of which finds in him a source of humor, often praises him as a good fellow and, generally speaking, does not too ardently or bitterly condemn his alcoholism. On the other side, and probably more potently expressed as life becomes more organized, is disapproval and bitter hatred of the drug which produces alcoholism, and there appears the sharpest condemnation of the industry and the laws which permit the individual to intoxicate himself.

Scientific Approaches to Alcoholism

The importance of alcoholism as a social and medical problem need not be demonstrated here. Its magnitude has created in a scientific era scientific approaches to the problem. Of these, the most concrete and the most important, but relating only to a small part of the disorganized eating habits of the alcoholic, is the main source of the neurological and organic brain injuries to the individual.

The discovery that Vitamin B_1 is needed in increasing proportion as the metabolism becomes increased, which happens with the ingestion of alcohol, and the fact that a relative or absolute deficiency of Vitamin B_1, together with the use of alcohol, produces alcoholic neuritis, is one of the main achievements of recent times on the subject of alcoholism. Alcoholic pellagra, on the other hand, seems directly related to the absence of some part of the B_2 complex, and it further appears definitely established that there is a relative deficiency of vitamin C in alcoholism, very likely due to the change in diet or the increased difficulty of absorption.

If one, however, compares the number of alcoholics to the number of people suffering from alcoholic vitamin deficiency, it becomes at once apparent that however important this relationship of the vitamins to alcoholic damage may be, it by no means explains alcoholism, nor is it pertinent to the prevention or causation of alcoholism.

Many attempts have been made to treat alcoholism by drugs which create nausea or distaste for alcohol. There is no particular need to review this subject at this time. In the main, despite the great prominence which these drug treatments, secret or revealed, obtained for a time and their vogue amongst alcoholics, they have not been successful. Evidently insofar as any chemical background is concerned, the answer to the treatment of alcoholism has not yet been found. Hopeful, at this stage, is the use of benzedrine sulfate (amphetamine sulfate) in combatting the depression and lowered mood of the alcoholic, and thereby lessening his need for the drug. It is, however, doubtful whether this drug will prove of value in a large number of alcoholics and its use will relate prophylactically to a relatively few cases.

A very common recent assumption is that the alcoholic is suffering from a neurosis of one type or other, and that alcoholism is either the manifestation of a neurosis or psychosis, or is in itself a neurosis. At first blush, there seems to be a good deal of truth to this point of view. Many persons with minor manic-depressive states drink episodically to offset the recurring failure to find interest and happiness in life. They seek, as an alcoholic friend of mine once said, euphoria, or anesthesia, or both. And one commonly finds a type of individual beset by inferiority feeling, who finds it difficult to enter into easy social relationships, or to meet his fellow-men with a feeling of equality, and who takes a drink—many drinks—to bring about the appropriate self-confidence. Dutch courage applies not only to the battlefield, but also to the arena of life itself, and alcohol has some value in supplying this type of courage.

So there has evolved a great deal of pyschotherapeutic work in connection with alcoholism, and there are many reports in the literature claiming a cure for alcoholism on the basis of the psychotherapeutic or psychoanalytic systems used. Hospitalization has become a common recourse for the treatment

of alcoholism. People are usually placed in such hospitals, first, when their alcoholism becomes a menace to their social and financial standing; second, when their health becomes seriously threatened; and third, not often acknowledged, but operating very forcibly, when their families get tired of seeing them around and of the emotional commotion which they cause. Most lay people are skeptical of hospital care for alcoholism.

Fleming says, "practically every form of therapeutic approach has been successful; religious conversion, psychoanalysis, apomorphine contra-conditioning, hypnosis, abstinence clubs, legislative and economic reforms, the several varieties of institutional routine—all have their coterie of enthusiastic advocates, all are fanatically intolerant of any approach but their own, and doubtless all may have a place in a rational therapy of chronic alcoholism."[1] To amplify this statement I would point out that where there are many treatments for the same condition, it is probable that none of them is really efficient, and that spontaneous cure or remission is taking place; that where there is a specific treatment, it wins the day and becomes the only or practically the only treatment used, as for example, antitoxin in the treatment of diphtheria, insulin in the treatment of diabetes, liver and kindred substances in the treatment of pernicious anemia, arsphenamine and fever therapy in the treatment of syphilis of the nervous system, etc., etc. In most of the hospital studies reported, there is a heavy bias of selection; the cases have not been followed to any extent, and the term "cured" is very loosely used, in view of the remittive character of alcoholism. It is also true that alcoholics, as James pointed out years ago, spontaneously undergo a change of heart and somehow or other become able to resist the lure and the temptation of the drug.

Jews and Alcoholism

The belief that alcoholism is a neurosis, either in itself or as part of a general neurotic clinical picture may be true, but it seems to me there are facts which indicate that another factor of greater importance than the neuroses or psychoses is operating to create alcoholism.

I turn the attention of the reader to the extraordinary lack of Jewish alcoholism and the bearing of this pertinent fact upon the general problem. All the statistics show, first, that the Jew rarely becomes an alcoholic in the sense of excessive indulgence or to the point of demoralization of his social functions and his personality, and, second, he rarely develops an alcoholic psychosis. These two sets of facts are separated because of their important bearing in the later discussion, the incidence of alcoholism and alcoholic psychoses amongst women.

I append here certain charts and statistics, first, from general hospitals where the acute alcoholic is treated, and second, from the state hospitals where alcoholic psychoses are cared for. To cite characteristic figures, in Wall's study of alcoholism in men, among 100 men, 3 were Jews; of his 50 females, none was a Jewess. In Ebaugh and Johnson's study on alcoholic psychoses, there were no Jews among 121 cases. They state quite pertinently, "No members of the Jewish race were included in this group, which is of interest in the face of the frequency of emotional, neurotic and psychotic disturbances in this race."

Kirby, in a comprehensive study made at the Manhattan State Hospital in New York, found "Among a total of 1403 admissions, 182 were alcoholic psychoses, and of these 62 per cent were Irish, the Irish making 29 per cent of the total number of all psychoses considered, with the Jews 22 per cent of the total number of cases, having but *1.7 per cent out of the total number of alcoholics*. There can be but little doubt that it is the social habits of the group that account for this remarkable contrast; for the Jews are by no means immune to mental disorders."

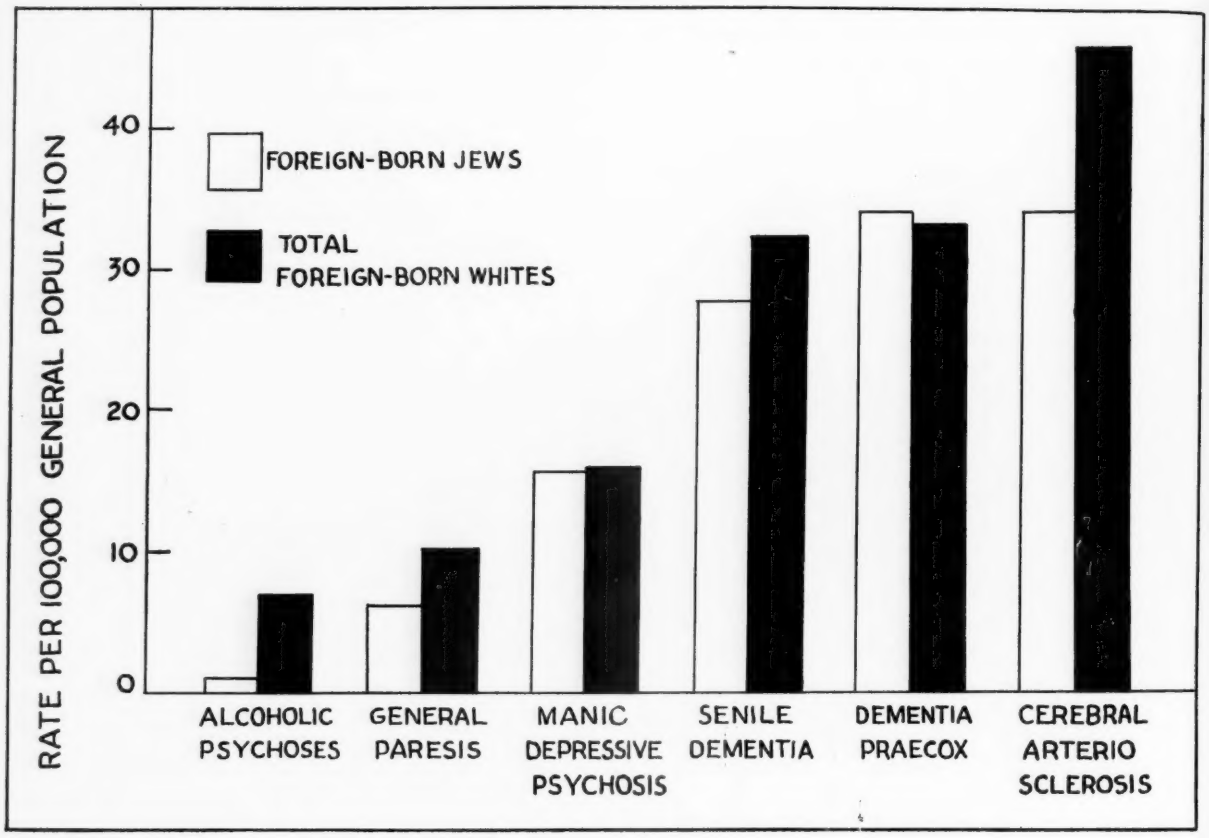
Pollock (in Emerson, Chapter XIV) indicates clearly that alcoholic mental disease is very rare among Jews. Out of 546 alcoholic first admissions for all races, 4 were Jews.

A further corroboration appears in the statistics, at present unpublished, of Krinsky, who states as follows: Between 1913 and 1938, 860 patients with delirium tremens were admitted to the Boston Psychopathic Hospital. No member of the Jewish faith was repre-

1. Fleming, R., "The Management of Chronic Alcoholism in England, Scandinavia, and Central Europe," *New England J. Med.*, 216:279-289, February 18, 1937.

sented in this group, which is an extraordinary fact.

It is well known that the Jew does not suffer in lesser degree than other races from neuroses and psychoses, but has his full share of them. The experience of any practitioner, of any clinic and of any hospital, and, more importantly, of any person acquainted with the grossly obtrusive facts of history, will show that the Jew has plenty of inferiority feeling, suffers greatly from depression and



lowered mood, has at least his full share of frustration, and lives in a world to which he finds great difficulty in adjusting emotionally and intellectually, as well as in the cruder economic and physical spheres. If alcoholism resulted primarily from the effort to offset the disagreeable and painful psychological states, the Jew would participate in alcoholism up to his proportion in any population. At least, so it would seem, unless we believe that the Jew cannot get drunk and cannot become an alcoholic. But the Jews intimately known to me do get a lift from alcohol, find themselves feeling better with moderate indulgence, get drunk with sufficient indulgence, and show the same general reactions to alcohol that every other type of individual does. The psychological and physiological responses of the Jew are the same to the drug as are, for example, those of the Irish, the English, or the Germans, the Latins, or the Slavs. Why then does not the Jew drink to excess?

I believe the answer lies in the social tradition of the Jew in respect to alcohol. Jews are rarely total abstainers. There are no Jewish total abstinence societies, and not even any Jewish temperance societies. *But nowheres and amongst no people is there more contempt, loathing, and even hatred for the alcoholic.* The term *"Er ist ein Shikur"* (He is a drunkard) designates an individual whom no respectable girl will marry, whom no business man will employ, who loses his friends, who is condemned in harsh and unsparing terms. To be a drunkard is to cease being a Jew, is to leave the fold of Jewry or to be pushed out. The attitude is that it is entirely unworthy of a Jew, man or woman, to get drunk, and while amongst the younger Jews getting "tight" is not regarded with the same loathing and contempt as amongst the elder Jews, nevertheless the tradition holds over

and operates very strongly against alcoholism of a chronic or recurring type.

Women and Alcoholism

I turn from the consideration of a small racial or social group to the consideration of one-half of mankind, namely, the women of the race. When we examine the facts of alcoholism and the alcoholic psychoses amongst women, two striking sets of phenomena appear which demand explanation or, at any rate, arrest attention.

The first is that the total incidence of alcoholism is low amongst women as compared to men. Wherever statistics* concerning the incidence of alcoholism amongst women have been collected, the proportion is about1.7, that is, alcoholism is predominantly a male urban disease, although the female of the species, when it comes to actual numbers, has a severe enough problem.

However, when we study the death rate from alcoholism, we find that the females have a much higher proportion of mortality than do males. This is summarized by the statement in Haven Emerson's book:

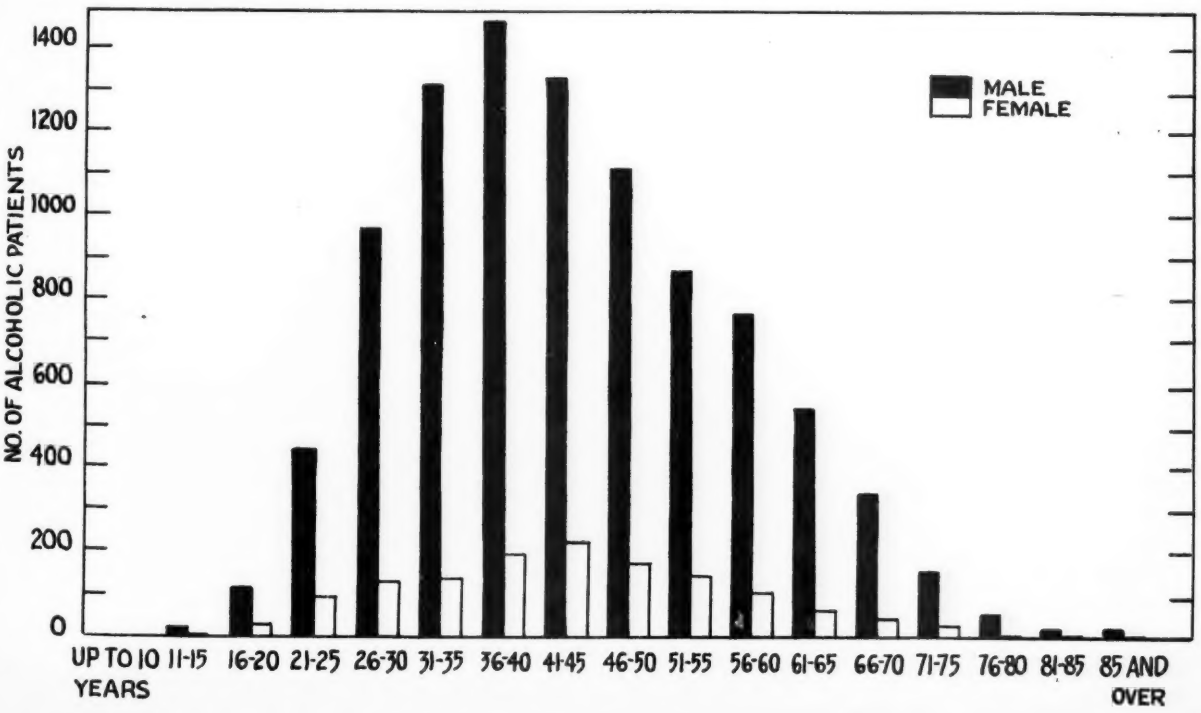
"The general death rate of patients with alcoholic mental disease per 1,000 under treatment in hospitals for mental disease in the United States in 1922 was 37.2 for males, 56.1 for females and 39.9 for both sexes. In New York State in 1930 the corresponding rates were 40.2, 54.1 and 43.3 respectively. The higher death rate and low recovery rate among females is probably due to the greater prevalence of Korsakow's disease among females."

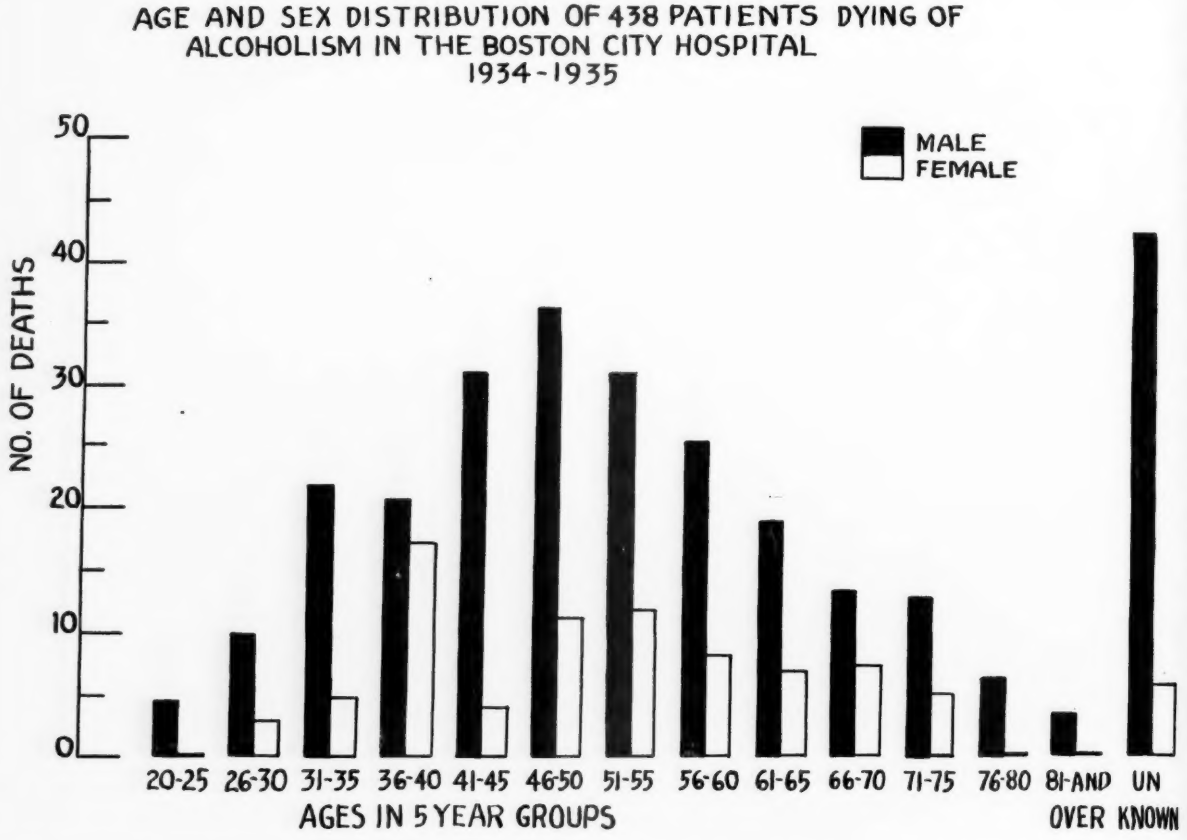
The answer to this is probably that the female alcoholic is a more solitary drinker and, because of her greater social degradation, eats less and suffers from vitamin deficiency in great degree. It can further be seen from Charts I and II (taken from Moore and Gray) on the alcoholic admission rate of male and female and the alcoholic death rate that the females have either a different resistance to alcohol or there are social and general health problems which make them more vulnerable in a lethal sense.

* For complete statistics on the subject see Emerson, Haven: Alcohol and Man; Macmillan Company, New York, 1932; the Annual Reports of the Commissioner of Mental Diseases, Commonwealth of Massachusetts.

Of the 860 patients previously mentioned as those admitted with delirium tremens to the Boston Psychopathic Hospital between the years 1913 and 1938, 82 or 9.5 per cent were women. Thus, the acute alcoholic psychosis is even less represented in females than chronic alcoholism, and especially less than the alcoholic psychoses themselves.

AGE AND SEX DISTRIBUTION OF ALCOHOLIC PATIENTS
ADMITTED TO THE BOSTON CITY HOSPITAL — 1930 TO 1936





It cannot be claimed that women have less of neuroses, inferiority, maladjustment; in a word, less social psychological difficulties than men do, and, in fact, it is only in the realm of the alcoholic and the syphilitic psychoses that the male excels his mate in getting into mental trouble. The incidence of the neuroses, of manic-depressive psychoses and dementia praecox, and the various non-organic mental diseases is fully as great, if not greater, amongst women as amongst men. Any person with clinical experience knows that insofar as the psychic difficulties of this world are concerned, they are certainly no less present for women than for men, and that on the whole, it is probably true that *women suffer mentally from the exigencies of life more than do their mates.* If frustration in the sexual field is of importance in the creation of neuroses, then there can be no question as to which sex has more social-psychological difficulty.

Despite, however, this general set of facts and circumstances, a l c o h o l i s m amongst women is decidedly less than amongst men. *I repeat what was stated in the case of the Jew, that a social tradition of enormous validity and importance is the factor which prevents or minimizes a l c o h o l i s m amongst women.* Up until very recently, for a woman to get drunk was to stamp herself as an abandoned and degraded creature. The college student of male sex might go out on a "bender" with his classmates without any serious disturbance to his egoism or to his social standing. The co-ed or the attendant at a woman's college could only do this at the risk of her prestige and her general self-respect. And, the same reactions prevailed among the humbler youth of the species. True, in the amplification of life permitted woman in the recent decade, a woman may get pleasantly "tight", but if she really gets drunk, she is "disgusting" and is treated as such. The fact that the drunken person becomes loose in conduct and disgusting in appearance operates with ten-fold more deterring power on women than on men. For woman has been brought up on a cult of propriety and, especially, of expected aestheticism and refinement, which is far more operative than that which works in the case of man.

In other words, society punishes the fe-

male drinker with greater blame and greater social ostracism than it does the male. The social expectation of s o b r i e t y in woman reaches a higher potency and a greater level than it does in the case of the man. Social expectation and social punishment are two of the most important agents in the moulding of conduct that mankind has.

Both in the case of the Jew and in the case of women, the greater sobriety, the lesser incidence of alcoholism may be laid to the common factor operating, namely, a social tradition which reaches back for many generations. In the case of the Jew, this social tradition is probably a part of the "survival mechanism" of a group living in a hostile population; in which the individual had to live, so to speak, by his wits in an environment where he had to maintain the full potency and coherency of his personality. Alcoholism became dangerous to the group and received severe punishment by the means of social blame and ostracism. In the case of woman, there was a general restriction of the life activities, especially in the field of the sensual pleasures. Man made the moral and ascetic rules of the game, but woman abided by them. Sociality was less group-like and more individual or familial in the case of woman. There was not the temptation to drink so much, and there was built up somehow a social expectation of non-drunkenness and non-alcoholism, with a proportionately severer punishment for infringement of this expectation.

A further proof of this thesis is not lacking. Whatever analysis is made of the facts of alcoholism prior to, during and after prohibition, it appears that there was an attempt to reduce alcoholism in the United States by education—in other words by a new social expectation and a new social tradition. Immediately following its enactment, the rate of alcoholism dropped enormously. But this was due to the operation of a *failure in the law of supply,* not a *failure in the law of demand.* The law of demand began to operate and supply followed, so that the final and net result of the enactment was, in a certain degree at least, to undo the effects of the previous educational procedures and to bring about by reaction a looser social attitude towards alcoholism.

It seems, therefore, obvious that what is necessary to prevent alcoholism is, first of all, the building up by social education of sterner, less tolerant attitudes towards alcoholism; that getting drunk, especially insofar as the young are concerned, shall be viewed with alarm and disgust and not with tolerance and good nature; that it shall be classed as what it really is, intoxication, the overcoming of personality and fundamental biological processes by a narcotic drug which renders the individual unsafe for most social responsibilities, disgusting to behold, and a nuisance to take care of. Whatever may be done in the individual treatment of the individual alcoholic, whether it be the use of drugs or the use of psycho-therapy in any of its multifarious forms, prophylaxis has at least two parts to it: First, *the building up of a level of social expectation which makes alcoholism a disgrace rather than a neurosis;* second, the establishment of a system of legislation which would make it easier to be temperate, although not by any means bringing about through prohibition a hostile social reaction.

The fact that the prohibition enactment did not accomplish its purpose does not by any means prove that legislation of any appropriate type and wisely constructed would be useless. It is not necessary to throw the baby out with the bath. It seems to me entirely unreasonable to say that legislation is inoperative merely because one type of law has failed. It seems to me quite certain that the legislators have betrayed the community. It was promised us that the bar would disappear if prohibition were repealed. The fact is that now there is a bar in every hotel, in many lunch-rooms, in every so-called high-grade restaurant, and even in establishments, which in prior times were not allowed to sell liquor at all. Some licensing system, by which the flow of alcohol could be controlled, rather than prohibited, should be enacted. This, or so it seems to me, is not an impossible task for American legislative bodies, if backed up by an educated public opinion.

Finally, it should be stated that the medical problem must still be attacked as such. There can be no question that we can do much more than we are doing to minimize the damage done by alcohol. Medical research, strictly de-

fined, may not be able to solve the problem of alcoholism, in the sense that it may not lead us to the complete or thorough-going prevention of excessive use of this chemical. Nevertheless, the prevention of the individual damage, the study of the individual as to why he himself drinks is still an imperative duty of medical and especially of neuropsychiatric science.

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NEWSNOTES

MEETINGS IN CANADA

It has been announced by the Dominion Government that a special Neurological and Neurosurgical hospital unit will be formed to serve the first Canadian contingent in France during the war. This unit, which is now in the process of formation, will be staffed by distinguished neurologists and neurosurgeons from Canadian hospitals.

The meetings of the Montreal Neurological Society for the present year are being devoted to some extent to neurological and neurosurgical subjects relating to warfare. Visiting speakers before the society during January and February are as follows:

January 10th, Dr. Houston H. Merrit, Boston, "The Medical Treatment of Convulsive Disorders."

January 24th, Dr. J. C. Meakins, Montreal, "Effort Syndrome".

February 7th, Dr. Byron Stookey, New York, "The Surgery of Peripheral Nerves in War".

February 21st, Dr. Lewis Pollock, Chicago, "Injury and Repair of Peripheral Nerves".

Other medical societies in Montreal and throughout Canada are likewise devoting part of their programs to the consideration of subjects relating to warfare.

Polyneuritis of Pregnancy
Report of Seven Cases

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Introduction

Recent advances in the field of nutrition have made it necessary to revise some of the traditional theories of the causes of disease, based in many instances on empiric thinking and practice. Among clinical writers, there has been a tendency to relate disease to the positive effect of something, be that something entirely unknown, rather than to regard it as the result of a lack of something upon which the organism is dependent. Multiple neuritis is a good example of this form of empiric reasoning, i.e. some alcoholics develop neuritis, therefore, alcohol is a cause of neuritis. That a comparatively small proportion of habitual users of alcohol develop neuritis has not deterred medical writers from classifying this and many other cases of polyneuritis as toxic. Strauss[1] put an end to this empiricism in the instance of "alcoholic" neuritis when he allowed ten men with polyneuritis to have their daily pint or quart of whiskey, and showed that adequate food and vitamin B brought about improvement in the neuritic symptoms.

Another form of polyneuritis which has shed its nebulous cloak of toxemia is neuritis of pregnancy. Although Whitfield[2] in 1889 described a typical case of polyneuritis and ascribed it to excessive vomiting, until recently, orthodox obstetricians have regarded it as the result of a toxic substance producing both vomiting and neuritis. Much has been written suggesting a relationship between malnutrition and neuritis of pregnancy, but wide acceptance of deficiency as the primary factor was deferred until Strauss and McDonald[3] reported successful treatment of three cases of neuritis of pregnancy by diets rich in vitamin B. Subsequent reports have confirmed the observations of Strauss and McDonald.

Pathology

The histologic changes in the nervous system are the same in all forms of polyneuritis and are identical with definitely known forms of deficiency neuritis (i.e. beriberi). These changes are characterized by cloudy swelling, degenerative changes and hemorrhages. Berkwitz and Lufkin[4] have presented excellent descriptions of the pathologic findings in three autopsied cases. They noted gross anatomical changes to be conspicuously absent. Microscopic changes were widespread and consisted of degenerative changes in peripheral nerves and anterior horn cells, most marked in the lumbar region of the cord, (loss of nissel substance, swelling of cells, eccentricity of the nuclei and, occasionally, cell necrosis), and petecchial hemorrhages in the brain and spinal cord. The liver and kidney showed mild cloudy swelling. Ford[5] of London reports similar findings in what he believes to be the first British report of complete autopsy findings in polyneuritis of pregnancy. His report is not detailed on the findings of the nervous system, but he reports cloudy swelling of the myocardium and liver, edema, congestion and cloudy swelling of kidneys, edema of the spleen, congestion of lungs, subpleural and subpericardial hemorrhages and hemorrhagic bronchopneumonia. These findings are especially noteworthy for they are similar in every detail to beriberi. Berkwitz and Lufkin make the interesting statement which has its corollary in observations made long ago in beriberi —namely, that the microscopic findings in the nervous system are less conspicuous than the severity of the clinical symptoms.

Physiology of Vitamin B

The recent work on the physiology of metabolic changes dependent on vitamin activity brings nearer the solution, or at least makes clearer the nature of the clinical changes in persons suffering from neuritic syndrome. Cowgill[6] pointed out in 1929 that vitamins are indispensable: (1) for the metabolism of carbohydrate, protein, fat, lipoid and other substances; (2) for the mechanisms of biochemical oxidations and reductions; (3) for immunity reactions; (4) for the metabolism of

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cell nuclei. Vitamin B_1 (thiamin) is looked upon as an enzyme or catalyst necessary to carbohydrate metabolism, promoting the disposal of certain breakdown products of cell metabolism during which oxygen is taken up and carbon dioxide is given off. Storage is wide spread in the body, highest in concentration in the liver, heart, kidney and brain. However, on deficient diet, storage declines rapidly, proceeding to low levels most rapidly in muscle, while the brain retains its storage longest. Cowgill[7] has shown that the amount of B_1 needed is proportional to the calories of carbohydrate ingested and body weight. Thus fever, pregnancy, lactation, exercise, hyperthyroidism and all conditions resulting in increased metabolism, place demands beyond the normal requirements of vitamin B_1 (1 to 2 milligrams or 300 to 600 I. U. has been estimated to be the requirement for the normal adult). High corbohydrate diet increases the need for B_1 and the substitution of fat for some of the carbohydrate lessens the need for B_1. Thus fat protects against vitamin B_1 deficiency. Deficiency may occur as the result of (1) inadequate intake of B_1 or (2) failure to digest and absorb vitamin B. Poverty, dietary fads and mental disorders predispose to deficiency disease due to inadequate intake, while gastro-intestinal disease will predispose to deficiency due to faulty absorption.

Prolonged vomiting results in an inadequate intake of vitamin B. Another factor in the deficiency of pregnancy is the alteration of gastric secretion which may result in faulty absorption of vitamin B and is no doubt associated with the macrocytic anemia of pregnancy. Studies in gastric secretion in pregnancy were made by Strauss and Castle[8], who carefully examined the secretory activity of 24 pregnant women at monthly intervals. Eighteen showed acidity below normal with accompanying reduction in ferment content and hydrogen iron concentration. All but one of the six with normal gastric juice during pregnancy had increased gastric acidity post partum, suggesting that they, too, had had a reduction during pregnancy. Anemia in deficiency disease is common, frequently of the macrocytic hyperchromic type in pellagra and pregnancy. Elsom[9] observed eight pregnant women in an outpatient service. Their diets, inadequate because of their economic status, were made adequate in every respect with the exception of vitamin B, which was continued in the same amounts as in their previous inadequate diets. All developed to some degree evidence of deficiency manifested by changes in the tongue, anorexia, constipation, edema of legs, increase in pulse rate, paresthesias, impaired vibratory sensation and macrocytic anemia. Notable was the absence of findings of characteristic change in gastric acidity. All patients responded equally well to brewer's yeast or liver extract, and were practically free of signs before delivery. Elsom's observations show that neuritis may develop in pregnancy without vomiting in those on suboptimal vitamin B intake.

Symptomatolgy

The appearance of signs of deficiency is dependent on the severity of the metabolic disturbance. If vomiting has been continuous, signs of deficiency may appear in the second or third months. The weight loss is a good indication of the nutritional state. General systemic signs will be in evidence before the appearance of neurologic manifestations. Mild sensory disturbances become more continuous and severe, are worse at night and are followed by gradually increasing weakness; ataxia and incoordination point to involvement of position sense. Foot drop may be the first evidence of paralysis. In some cases, the foot drop may be missed and general paralysis of the legs seems to appear suddenly, often after therapeutic abortion or delivery. The hands and arms are usually less involved and weakness appears after it is well marked in the legs. Atrophy of the distal parts of the extremities may be concealed by edema, but will always be present in severe cases. The cranial nerves most commonly involved are the facial, glossopharyngeal and the vagus. With aphonia, dysphagia and paresis of the facial muscles and extensive paralysis of the skeletal musculature, the syndrome closely resembles the neuritic manifestations of beriberi. The heart findings common to beriberi are frequently associated with polyneuritis and are well described and related to deficiency by Weiss and Wilkins.[10] Edema and hemorrhages of the retina are not infrequent. The four cases presented by Berkwitz and Lufkin[4] had edema of the optic discs, three

with retinal hemorrhages.

Thus it will be seen that polyneuritis of pregnancy is a grave disorder accompanied by evidence of dysfunction of all systems and organs. Secondary infections are common and are often seen in the mouth, urinary tract and respiratory tract. Death may be the result of pneumonia, but is more probably the result of sudden heart failure or cranial nerve paralysis. The following cases better illustrate the symptomatology and course of the disease than any amount of description.

SYMPTOMS OF DEFICIENCY							
Skin and mucous membranes	Alimentary tract	Cardio-vascular system	Hemopoetic organs	Nervous System			
				Sensory	Motor	Cranial Nerves	Mental
atrophy, scaling pigmentation flattened dry nails dermatitis ulceration redness of mucous membranes gingivitis edema	anorexia glossitis stomatitis proctitis vomiting diarrhea constipation hypochlorhydria achlorhydria atony ulceration loss of weight	tachycardia bradycardia cardiac enlargement hypotension normal B. P. or hypertension changes in Ekg. reflex irritability (vagal) Pulmonary congestion pneumonia common	hypochromic or hyperchromic anemia	paresthesias numbness pains: worse at night present in legs before arms fleeting at first later persistent position and vibratory sense disturbed	weakness at first paralysis may be gradual first in legs beginning with foot drop may come on suddenly	may not be involved nystagmus common severe cases: bilateral facial paralysis, vocal cord paralysis, difficulty in swallowing hemorrhage and edema optic discs	loss of memory emotional instability anxiety restlessness confabulation severe cases: delirium

Comment: This occurred before the relationship of deficiency and neuritis was appreciated and the patient had no special treatment.

Case 41,394: A twenty-six year old woman who vomited seven or eight times daily the first three to four months of her second pregnancy was hospitalized for a week on two different occasions and given intravenous fluids without relief from vomiting. She estimated her weight loss at twenty to thirty pounds. On admission to the Wisconsin General Hospital (5-17-35), she was 4½ to 5 months pregnant. Vomiting had stopped two weeks earlier. Pain had begun in her knees May 7th and on May 10th, following an attempt to walk upstairs she had fallen. Thereafter, pains in her knees and feet were severe. Dyspnea, palpitation and "gas pains in stomach" had been present for four days. On the day before admission, severe continuous pains had developed in the right side of her chest. The examination gave bilateral foot drop, weakness in all muscle groups, legs more involved than the arms, findings more marked on the left than on the right, slight flexion deformity of the hips and knees, marked tenderness in the muscles of the thighs and calves, tenderness of the feet, hyperesthesia of the lower right chest and lower extremities, absent tendon reflexes and nystagmus (fundi normal). Tachycardia and reflex cardiac irritability prevailed throughout hospital observation. Blood pressure readings were normal.

The flexion deformities were relieved by

Case Reports

Case 37,678: A thirty-two year old woman began vomiting in the fifth month of her fourth pregnancy (April 1929). Labor was induced because of continuous vomiting and loss of weight, and a dead fetus was delivered. Vomiting ceased, but paralysis of the legs appeared and paresthesias and pain in the legs and arms persisted. She was admitted to Wisconsin General Hospital August 3, 1929 and the following findings are recorded: Face and hands edematous; blood pressure 170-120; emotional instability; nasal, slurred speech; wrist drop; atrophy of the distal parts of the extremities; foot drop; paresis of muscles of legs; and bladder incontinence.

Inquiry by letter, February 22, 1937 brought forth the information that the patient was unable to get about for a year after discharge from the hospital, but that she is fully recovered except for "stiffness in the ankles and feet."

traction. She was placed on a high vitamin, high caloric diet supplemented by vitamin B, orange juice, and haliver oil with viosterol. Pain was alleviated and no further motor impairment developed. She was discharged July 15 and was delivered of a normal child October 1. She remained in bed until November 17, 1935. She gradually improved and reports (May, 1939) show that she was entirely recovered within a year, except for spells of dizziness which have occurred frequently since.

Case 88,143: A woman, age 30, began to vomit in the first month of her first pregnancy, May 1935. The vomiting became more frequent and continuous until she retained no food. The usual treatment with intravenous glucose failed. Psychic disturbance and aphonia appeared. An abortion was induced on August 1st, at which time she weighed eighty pounds. Vomiting stopped, but pains became more intense and paralysis developed rapidly. She was seen September 14th by a neurologist and the following findings recorded: Weight 73 pounds, achlorhydria after histamine, hemoglobin 65 per cent, white blood cells 18,700 with tachycardia, nystagmus, marked spontaneous pain in the muscles of the legs and in the feet, bilateral foot drop, contractures of the hamstrings and gastrocnemius, atrophy below the knees, hypesthesia below the knees and absent tendon reflexes. Treatment consisted of a cast with turnbuckles to correct contractures at the knees, physical therapy and the following vitamin regimen: Liver extract 3 c.c., haliver oil 20 mgs., brewer's yeast 72 gr. daily, 180 units of rhyzamin B (extract of rice polishings) for five days, vitamin B_1 concentrate 10 c.c. daily for three days followed by Lilly's B_1 capsules (natural) 3 mgs. daily. After three weeks of treatment she was sent home, gradually tapering off the vitamins over a period of five months, while physical therapy was continued in the outpatient department.

Comment: The immediate effect of treatment was the alleviation of pain and the stabilization of the heart. She gained thirty pounds in three months and could walk three blocks with a cane without fatigue. She discarded the cane in May, 1936. She was examined in February, 1938, and found to weigh 130 pounds. There were no detectable neurological defects.

Case 96,830: This woman, age 21, began vomiting in the sixth week of her first pregnancy (July 15, 1936). An abortion was resorted to in September at which time she had marked mental disturbance, but vomiting continued until October. General weakness, dimness of vision and marked weakness in the legs developed, to be followed by collapse and sudden paralysis of the legs. She entered Wisconsin General Hospital May 7, 1939, for relief of contractures. Findings: Weight 140 pounds (weight loss 70 pounds), no memory for much of the illness, pitting edema of legs, flabbiness of muscles of legs, palms and soles of feet unusually pink, gingivitis, pulse stable, blood pressure 125/85, flexion deformity of legs, hypesthesia below the knees, impaired position and vibratory sense, tenderness of muscles, marked weakness of hands, foot drop and general muscular weakness. X-ray of bones of feet showed extensive demineralization; the white blood cell count was 19,700; the gastric contents showed 14 degrees of free acid; the spinal fluid was normal. A biopsy of the gastrocnemius muscle showed a marked degenerative lesion, i.e. muscle fibers were small and many were vacuolated. Some fibers were replaced by fat, and cross striation was lost in many places. She was given a high vitamin diet, vitamin B_1 3 mgs. daily as well as cevitamic acid and irradol A. She developed an acute delusional agitated state July 16, and her family insisted on taking her home August 4, 1937.

Comment: A letter, May, 1939, states she has walked without crutches since December of 1938, but she has difficulty walking up and down stairs.

Case 97,537: A woman, age 22, began vomiting late in April of 1937 and by May 15, could retain nothing. She entered the Wisconsin General Hospital June 20, 1937. Hiccups had been present two weeks. Findings: Thin, pale, dehydrated, overactive heart (rate 138), blood pressure 128/76, hemoglobin 12.4, red blood cells 4,320,000, white blood cells 15,800, 94 per cent polymorphonuclears, blood chemistry normal. She was given 36 gr. of yeast concentrate daily. Vomiting had stopped by July 1st, but her weight was 83 pounds. She com-

Furnished through the courtesy of Eli Lilly, Indianapolis, for trial use.

plained of numbness and her tongue and pharynx were red and granular. Labor was induced July 15, and resulted in expulsion of a small macerated fetus, while a second large fetus was removed manually. On July 20th, she complained of severe pain in her legs and a paralysis of vocal cords was discovered. Examination on July 21st gave the following findings: Emaciation, beefy red tongue, exophthalmos, general muscle tenderness, paralysis of facial muscles, aphonia, muscle volume reduced and marked weakness, but no complete paralysis except for the rectus abdominus.

A member of the anesthesia department demonstrated that continuous regurgitation of stomach contents into the lungs was occuring. Massive doses of vitamin B had been started July 21, but she died July 23.

The pulse rate ranged from 120 to 140 throughout her hospital stay. The autopsy revealed hemorrhages in the sclera, petecchiae about the neck and upper chest. Gross examination of organs showed thinning of the cardia of the stomach and hemorrhages in the mucosa, poorly defined kidney markings, purplish red consolidation of both lower lobes of the lungs, congestion of the brain and cord. The microscopic examination disclosed pneumonia, chronic passive congestion and cloudy swelling of the liver, congestion, cloudy swelling and vacuolar degeneration of the kidneys, atrophy of the stomach, thickening and edema of the intima of the aorta.

Comment: Unfortunately, the heart and nervous system were not examined, but the organs that were examined showed the characteristic findings of beriberi and are identical with those reported by Ford[5]. Vitamin therapy was grossly inadequate until the fulminating stage had been reached.

Case 201,084: A female, 38 years of age, was admitted to the Wisconsin General Hospital January 15, 1938. The patient's memory was so defective that history was obtained from her husband. The last menstrual period was June, 1937. Vomiting started in the 6th week of pregnancy. She ate "almost nothing" from July to September, her weight decreasing from 206 pounds to 170 pounds. She became so weak that she had to remain in bed and when forced to walk complained she could not control her legs. She complained also of dizziness, and numbness in arms and hands. Poor memory was noted in September. She was given small doses of yeast and liver from September to December. In December, small doses (3 mgs. daily) of B_1 by mouth was added, followed shortly by cessation of vomiting and improvement in appetite.

Examination on January 17, 1938 showed cloasma on the face; tachycardia; blood pressure 118/76; marked memory defect for recent events; apprehensive mental state; vacuous facies; nystagmus; dilated reactive pupils; nasal speech; marked tenderness in calves and in feet; weakness of the trunk muscles; weakness in the legs, most marked in iliopsoas and quadriceps; flexors and extensors of feet had good power, but the calf muscles were flabby; sensory discrimination, position and vibratory sense were impaired in the legs below the knees. The disability seemed out of proportion to the motor findings. In the laboratory were shown hyperchromic anemia, absence of free HCI acid after histamine, electrocardiogram was not characteristic of beriberi, spinal fluid was normal, biophotometric examination showed deficiency of vitamin A. A biopsy of the muscles of the calf at this time showed no significant change. Treatment consisted of liver extract 3 c.c. three times a week, yeast concentrate 72 grains daily, betalin 6.6 mgs. daily by mouth until February 20th, betalin 50 mgs. daily intravenously from February 7 to April 13. Partial foot drop was noted March 15th. The muscles of the calf were still tender and marked sensory changes below the knees persisted. A biopsy of these muscles on March 29th showed degeneration of the fibers, loss of striation, increase in sarcolemma nuclei, and some lymphocytic infiltration. A healthy baby was delivered uneventfully April 1, 1938. In June, she started walking with a walker and then with a cane. She was discharged June 17 and continued to take vitamin B_1 5 mgs. by mouth and 18 grs. of yeast daily. She was seen in the outpatient department 10-20-38. She was then walking short distances, guardedly, without a cane. The calf muscles were still tender, feet pronated because of paralysis of posterior tibial muscles; disturbance in position sense had persisted.

Comment: This case was carried along to a successful termination of the pregnancy. Had

adequate vitamin therapy been instituted in the early months, the neuritis might have been prevented.

Case 200,889: A woman, age 22, had taken all her meals for three or four years in a restaurant. Sandwiches of white bread and black coffee constituted her usual meal; milk, meat, eggs, fruits, fresh vegetables were rarely included. She became pregnant and started vomiting July 1937. An abortion six weeks later terminated the vomiting. At this time, pains in the shoulders and arms and numbness in legs had appeared. Vomiting recurred November 10th and continued for a month. At this time she was blind for several days. This recurred in December, when she was taken to a local hospital. Blindness was temporary, but the pains in her shoulders and arms became so severe she could not sleep. This was followed shortly by paralysis in her arms, aphonia and dysphagia and lastly by loss of motion in her legs. The father recalled a period of hematuria of one or two weeks in the fall.

She was admitted to the State of Wisconsin General Hospital January 4, 1938, where in a few days an incomplete, but extensive paralysis became complete, including all skeletal musculature except muscles supplied by the 11th cranial nerve. The pupils were widely dilated, the face and tongue were markedly paretic, the vocal cords could not be closed and she choked frequently. The muscles were tender; all reflexes were absent. Sensory examination showed impairment of tactile sense over the abdomen and inner thighs and of vibratory and position sense in the great toes. She became incontinent and had hematuria. Hazy cornea obscured good visualization of fundi, but no pathological changes were seen. Mentally she was clear and oriented, but her memory was defective. There was marked emaciation and pallor. The gums were spongy and white, yielding fusisporillae on smear. The heart was not enlarged, but a marked tachycardia, ranging from 100 to 140, with reflex irritability prevailed. The diastolic blood pressure remained above 125, and the systolic varied from 150 to 170. The electrocardiogram showed a tachycardia and depressed T waves (T.3 nearly flat) and changes in conduction time. Adequate gastric acidity was found and the blood count and spinal fluid were normal. The total blood protein was 5.7, the albumin 3.9, the globulin 1.8, the albumin-globulin ratio 2.1, and the blood chlorides were 469. Ascorbic acid in the urine was below the normal level.

Treatment consisted of 3000 calories of food to which was added rhyzamin B 800 units and haliver oil concentrate 45 mgs. by stomach tube; 50 mgs. of vitamin B_1 and 400 mgs. ascorbic acid, subcutaneously and intravenously. In a few days, feeble movements of abduction and adduction of the legs and flexion at the knees returned. She died suddenly January 17.

In this case a polyavitaminosis is assumed. The hematuria suggests a low vitamin C saturation, while the cloudy cornea was thought indicative of a low level of vitamin A. The rest was clinically beriberi. The post-mortem examination revealed cerebral and pulmonary edema and a small patch of pneumonia. The heart was grossly normal (weight 214 grams). However, its muscle showed some vacuolar degeneration. The spleen showed acute congestion and some hyaline in the corpuscles and in the walls of a few arterioles, while the liver showed fatty and vacuolar degeneration and vacuolation of some of the nuclei. There was acute congestion and parenchymatous degeneration of the kidneys. The muscle specimen from the pectoralis group was not taken from the best location to demonstrate the degree of change expected, but showed some atrophy with proliferation of the sarolemmal nuclei and sparse round cell infiltration. A section of the median nerve taken from the axilla showed granularity and fragmentation of the myelin sheath, proliferation of the neurolemma cells, and irregular lymphocytic and phagocytic infiltration. In the spinal cord were shown degeneration of the anterior horn cells, neuronophagia and sparsity of cells.

Comment: The clinical findings appear to be out of all proportion to the pathological findings, emphasizing the metabolic and chemical nature of the disorder and the necessity of adequate treatment before the fulminating stage appears.

It seems certain that many failures in neuritis of pregnancy where the death rate has been high are due to failure to rcognize the early signs of nutritional deficiency which

preceed the neuritic syndrome and to sub-optimal dosage of supplementary vitamins. Since B_1 requirements increase with increased caloric intake, with increase in weight, and since metabolism is increased in pregnancy, the requirements of the pregnant woman are greater than in her non-pregnant state, perhaps 3 to 5 times greater according to animal experimental work.

Hence, the diets of all pregnant women should be supplemented by at least one 5 mgs. tablet of thiamin (B_1) daily. Since anemias of pregnancy are common and respond to yeast it is thought that another factor in the B complex is important. Therefore, it is suggested that yeast concentrate be given prophylactically in doses of 1 to 3 grams daily.

As yet, the etiology of the vomiting is not clear as to whether it is a sign of early deficiency or of endocrine-hypothalamic origin. Vomiting is known to be a symptom of deficiency, often associated with hypochlorhydria. It has been erroneously concluded that the vomiting of pregnancy was of psychogenic origin. In most instances, it should be assumed that the woman is not neurotic because she vomits, although she most certainly will become neurotic if not neuritic should vomiting continue. In the past, the treatment of vomiting has been irrational becaus the role of B_1 in cell metabolism was not understood. Large quantities of glucose and fluids have been given, which in the present state of knowledge is wrong since glucose increases the B_1 requirements, and it is thought that excessive fluids wash out the storage of B_1. When vomiting starts, immediate steps should be taken to bring it under control. If examination of the secretory function reveals a low free HCl, vitamin B_1 should be given intramuscularly 10 mgs. daily, and 3 c.c. of liver extract may be added to the thiamin solution to add other nutritional factors. It is thought that absorption of B_1 is faulty in the absence of hydrochloric acid. As soon as vomiting is controlled and anorexia has improved (vitamin B stimulates appetite) the diet should be increased.

In the presence of definite evidence of deficiency, the doses of vitamin B should be increased to 20 to 50 mgs. or more daily, depending on the severity of symptoms. Marked cardiac involvment, if due to alteration in the muscles of the heart, as in beriberi, may call for large doses intravenously. With the decrease in the heart size and stabilization of the pulse the dose can be decreased. Gastrointestinal symptoms, glossitis and pharyngitis call for nicotinic acid, 500 mgs. (100 mgs. doses) a day for 10 to 14 days. The mental symptoms respond rather promptly to treatment. In serious states of deficiency, a 3000 to 4000 caloric diet should be given when vomiting has stopped, using frequent small feedings, by tube, if necessary.

The paralysis will not respond as rapidly to therapy as the other systemic symptoms of deficiency, but may require many months for regeneration of peripheral nerves. During this time, vitamin B should be continued in doses large enough to more than cover the normal requirements. At present, at least eight factors are known to be present in the B complex. The significance of some of these factors in human metabolism is not known. Under these circumstances, the B complex should be given (liver and yeast), as well as thiamin chloride and nicotinic acid.

It is important to remember that the need for other vitamins increases in pregnancy and that in deficiency there may be a lack of vitamins A, C, and D as well as B. These needs should be met as well as those for iron and calcium. Theobald[11] advances the hypothesis that there is no such thing as toxemia of pregnancy, if by this term a hypothetical toxin or toxins peculiar to pregnancy are postulated, and that all manifestations are associated with dietary deficiency. He emphasized especially the need for adequate amounts of calcium as well as vitamins, iron and iodine.

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Psychiatric Aspects of Amphetamine (Benzedrine) Sulfate Therapy

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In this communication, we are reporting the results of three and one-half years experience with amphetamine (benzedrine**) sulfate therapy in psychiatric conditions. We have treated more than 300 patients in whom depression was present.

The method of procedure has been previously described and includes administration by the oral and intravenous routes. The dosage is usually 10-30 mg. given as a single dose in the morning. It may be given in divided doses, but it is necessary to avoid medication in the latter part of the day as the drug may prevent the patient from sleeping. It is advisable to start with 5 mg. in order to detect the presence of idiosyncrasies or untoward reactions. Amphetamine has also been utilized in conjunction with sedative drugs (infra) and may be administered then to patients who are excited as well as depressed.

General Aspects

Indications: (1) Amphetamine sulfate is of greater value in acute toxic or infectious states than in functional states and psychoneuroses. (2) It is of more value in acute toxic states than in more prolonged organic conditions. In organic psychoses, where deterioration is in progress and defects of the sensorium or personality alterations have developed, the response is uniformly unsatisfactory. (3) Amphetamine appears to be of greater value in organic states when no psychosis is demonstrable. (4) In the psychoses, amphetamine sulfate appears to be of more value in those cases of recent onset due to intoxication, particularly where alcohol is the etiological factor, than in functional psychoses. It has a beneficial action in post-infectious and post-traumatic psychoses. Paranoid conditions of whatever origin are not infrequently aggravated by the drug. (5) In organic conditions without psychosis, the drug appears to be of most value in narcolepsy and of considerable worth in acute alcoholism. It possesses some advantage in post-encephalitic Parkinsonism when administered as an adjuvant to stramonium, belladonna, scopolamine, atropine or 'Bulgarian Treatment' (Rabellon). Amphetamine sulfate may possess some merit in barbiturate and morphine intoxication, and in post-infectious and cranial traumatic conditions.

Contra-indications: We have described the action of amphetamine as variable, unpredictable and paradoxic. The definite contra-indications to the administration of amphetamine sulfate are states of hypertension, coronary artery disease and states of excessive excitement.

Precautions: There are a number of circumstances in which amphetamine sulfate should be administered with considerable caution, because of the possible occurence of harmful effects. These include: The indis-

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** The Benzedrine brand of Amphetamine Sulfate is supplied by the Smith, Kline and French Laboratories, Philadelphia, Pennsylvania.

criminate use of the drug for symptomatic relief without adequate supervision or thorough investigation; idiosyncrasy to small doses of the drug or the early appearance of alarming untoward effects; more severe forms of vasomotor instability; wide daily fluctuations in the blood pressure or the pulse rate; generalized arteriosclerosis; senility; atonic states of the gastro-intestinal system; hepatic insufficiency and thyroid hyperfunction; tendency to physical overactivity; agitated depression; history of previous excitement as in mental deficiency and epilepsy; history of homicidal or suicidal tendencies; history of convulsive seizures; anorexia; insomnia; states of asthenia associated with exhaustion, debility, anemia and lowered bodily resistance; psychopathic personalities and other individuals where habituation is apt to occur; and persons who request the drug. Particular attention must be given to these conditions in clinic or private practice.

The increased sensitivity of individuals with asthenic habitus should be considered. We must condemn the use of amphetamine sulfate in preparing individuals for periods of excessive physical or mental exertion.

Habituation: A number of our patients have enjoyed the sensations produced by amphetamine sulfate and have requested further doses of the drug. This was particularly true of those who had a liking for spirituous liquors. Some individuals compared their sensations with those of a mild state of alcoholic intoxication. We are convinced that in certain persons, at least, amphetamine sulfate is habit forming. We have noticed this tendency in persons addicted to alcohol, morphine and other drugs, in neurotic and psychopathic individuals who crave medication, and in people who work under excessive strain such as actors, truck drivers, students, nurses and physicians. The amphetamine habit appears to be similar to the daily use of moderate amount of caffeine, nicotine or alcohol. At present, there is insufficient evidence to definitely establish whether the patient is worse after amphetamine has been discontinued than he was prior to its administration. The development of tolerance is consistent with habit formation.

Untoward Effects: We have summarized the unpleasant effects in previous publications, including the untoward psychologic and central and peripheral physiologic reactions. Toxic effects may be considered to be an aggravation of the usual reaction to the drug from excessive dosage; the occurrence of alarming and harmful reactions from small doses (idiosyncrasy) or the occurence of unpredictable or paradoxic responses, which are dangerous to the patient. We have observed, at times, that over-dosage has produced increased irritation, assaultiveness, confusion, hallucinations and delirium or syncope; that dementia praecox patients have been precipitated into panic; that mentally ill persons have made suicidal or homicidal attempts; that a few patients have shown cardiac and vasomotor collapse associated with paradoxical falls in blood pressure and pulse. In the great majority of patients, however, the drug is without harmful effects if properly administered.

Specific Aspects—Organic States

Alcoholism: Amphetamine sulfate is of value in the more acute phases of alcoholism with and without psychosis. In the acute phases of alcoholic intoxication: without psychosis, amphetamine sulfate has been most effective. The characteristic physiologic and psychologic after-effects of acute inebriation have been dissipated quickly by the drug. In the acute alcoholic psychoses, the length of time necessary for recovery was considerably diminished and the number of recoveries was increased. We have noted the tendency of amphetamine to abort an alcoholic psychosis. In the protracted alcoholic psychoses, tending toward deterioration, the results were of very little significance except in the early Korsakow's group where a smaller number of cases required commitment after treatment with the drug. In alcoholic states complicating other mental illness, amphetamine sulfate at times has been of value in differentiating the states of depression due to alcohol alone, which are usually rapidly dissipated by the drug from the states of alcoholic depression superimposed on and masking depression of psychogenic origin, which do not respond as readily to the drug. In certain alcoholic psychoses, particularly where excitement was a prominent feature, beneficial response was

obtained by employing the combined amphetamine sulfate-sodium amytal treatment, which is presented in detail in the discussion on dementia praecox (infra).

In regard to chronic alcoholism, a review of the alcoholic individuals admitted to our hospital over a period of several years and diagnosed as without psychosis: alcoholism, revealed that a number of these persons were re-admitted subsequently with deteriorating alcoholic psychoses. In these, amphetamine sulfate had no beneficial or deterrent effect. These cases further indicate the type of patients we are including in the group, classified without psychosis: chronic alcoholism involving addiction. We are not discussing the more-than-occasional social drinkers, but chronic imbibers who have developed sufficiently abnormal reaction patterns while drinking to necessitate admission to a mental hospital to determine whether or not they are psychotic. In the hospital, these patients, although not considered psychotic, exhibited frequently depressive after-effects of continuous daily imbibing. On these symptoms, amphetamine sulfate exerted a prompt ameliorating effect.

However, in regard to alcoholic addiction, temporary improvement was observed in only 10 per cent of cases who were followed in our outpatient clinic. All patients who have been treated for more than three months have had at least one relapse. Most of them sooner or later discontinued the medication of their own accord or abused its use. We have not been able to observe any deterrent effect on the alcoholic habits of these chronic drinkers from the continuous or sporadic use of amphetamine sulfate. Indeed, the opposite seems to occur at times. Some patients placing false reliance on the knowledge that the distressing after-effects are dissipated quickly by the drug, imbibe more freely and then resort to the ill-advised and dangerous procedure of self-medication. This undesirable practice has extended to social drinkers.

The continued unsatisfactory response of chronic alcoholic addicts to amphetamine sulfate seems to indicate, as we have previously stated, that successful treatment of chronic alcoholism itself requires hospitalization in an institution set aside for this purpose.

Barbiturates and Morphine: We have found that amphetamine sulfate will quickly arouse patients intoxicated with moderate doses of barbiturates. However, in poisoning from massive doses, the results have not been as favorable, because of the physiologic depression by the barbiturate of the respiratory center, which is unresponsive to amphetamine (in therapeutic doses), and because of the extent of the toxic pathologic process. There is some evidence to indicate a synergy of harmful effect in combined massive doses of both drugs. In stupors due to morphine, amphetamine sulfate appears to be of value in shortening the comatose period, when used in conjunction with other recognized procedures. The drug appears to be of value in counteracting withdrawal symptoms. As in chronic alcoholism, the drug has very little value in overcoming morphine addiction. In psychoses resulting from intoxication with barbiturates and morphine, we have noted results comparable with those of the alcoholic group.

Narcolepsy: We have observed beneficial results in narcolepsy, but found that amphetamine sulfate had no effect on narcoleptic attacks produced by gross organic pathology. Narcoleptics with psychosis have not responded well. It seems that amphetamine sulfate is of greatest value in narcolepsy where no specific etiologic factor or psychosis is demonstrable.

Pyknolepsy: We have observed mild improvement in three of six cases in whom a diagnosis of pyknolepsy was made. In these patients, amphetamine sulfate was most effective in combination with bromides or with bromides and phenobarbital.

Epilepsy: In psychosis with epilepsy, we have found amphetamine sulfate of little value except for temporary amelioration of post-epileptic depressions. However, in epileptics without psychosis, amphetamine sulfate with bromides and phenobarbital have been of some value in reducing the number of seizures. However, in no cases were the epileptic seizures entirely controlled; and in a few patients the attacks were more frequent.

Head Trauma Group: In somnolence and depression, following trauma to the head, amphetamine sulfate has been of some value in ameliorating these symptoms. However, careful physical examination must always

precede its administration in these cases and the drug must be given with considerable caution here, particularly in regard to blood pressure and pulse variations. In early traumatic psychoses associated with depression, amphetamine was effective in increasing the patient's alertness in more than half of the cases.

Postencephalitic Sequelae and Parkinsonism: In our experience, amphetamine sulfate has been a beneficial adjuvant to stramonium, scopolamine, atropine or the 'Bulgarian Treatment' (Robellon) in patients with postencephalitic sequelae or Parkinsonism, when there were minimal organic defects and personality changes. However, patients with demonstrable psychotic states were not as favorably influenced. Oculogyric crises have responded well.

Infectious Diseases: In psychoses associated with infectious states, amphetamine sulfate was of value in dissipating the depressions. However, in the absence of psychosis, amphetamine sulfate was more effective in allaying the symptoms of torpor or apathy, frequently appearing subsequent to the infection. In these conditions, the drug must also be given with considerable caution and the patient must be carefully watched for blood pressure and pluse variations.

Specific Aspects—Functional States

Dementia Praecox: Oral amphetamine sulfate. After a period of careful physical and mental observation, the patient received daily an oral dose of 10 to 30 mg. of amphetamine sulfate for periods varying from ten days to three months, except in instances where the drug had to be prematurely discontinued. The method of investigation has been previously described.

Thirty-three per cent of cases of less than two years duration were improved. However, only 15 per cent of cases of over two years duration were benefitted. In the control group, only 24 per cent of early cases showed comparable, favorable results.

(2) Intravenous amphetamine sulfate and oral sodium amytal. After a period of careful physical and mental observation, during which an oral test dose of sodium amytal was administered, the patient received on the first day 10 mg. of amphetamine sulfate intravenously. The physiologic and psychologic responses were closely observed for 12 to 16 hours thereafter. The following day the patient received sodium amytal orally in doses of 0.1 to 0.2 gms. repeated every hour until narcosis was obtained. This was allowed to terminate spontaneously. The third day amphetamine sulfate 30 mg. was injected intravenously and on the fourth day amytal narcosis was again induced by oral administration. This program of alternating stimulation with 30 mg. of amphetamine sulfate intravenously and narcosis with sodium amytal orally was continued for two to three weeks. In general, 0.6 to 0.9 gms. of sodium amytal was required to produce narcosis. This method is applicable to both self-absorbed and excited cases.

This intravenous regime in combination with sodium amytal appears to produce the best results. 50 per cent of the early cases were returned to their homes. Amphetamine sulfate appears to be more effective in the early cases and in the catatonic types.

Long continued observations of a larger series of patients correlated with adequate control studies will be necessary before we can determine accurately the value of amphetamine sulfate procedures. The favorable results thus far encountered may be due to the short period of observation, particularly in the combined therapy. Until recoveries from dementia praecox are recorded as "five and ten year cures," as is done in estimating the response in neoplastic disease, we will be unable properly to evaluate the real worth of any of the pharmacotherapeutic procedures now in vogue. The value of large doses over longer periods of administration must be investigated. The psychic effect of the increased attention to the patient entailed in the amphetamine sulfate procedures and other similar regimes cannot be disregarded.

Amphetamine sulfate may be of value in rendering patients more adaptable and more accessible to understanding, investigation and psychotherapy; in arriving at a differential diagnosis, particularly between schizophrenia and alcoholic psychoses; in indicating to some degree the plasticity and integration of the personality; and in promoting more coordinate activity.

Although certain untoward reactions in

the course of amphetamine sulfate administration occasionally occur and, at times, counter-balance the beneficial effects, in general, the regimes herein described are easy to administer and seem to present less of the dangers and difficulties encountered in some other pharmacotherapeutic procedures. In those cases of schizophrenia which are inherently capable of being stimulated to some degree of improvement, amphetamine sulfate may initiate, accelerate, augment and/or indicate such improvement.

Manic Depressive Group (Depressed Type): In 30 per cent of the cases the rate of improvement was apparently accelerated by amphetamine sulfate. In half of the cases a state of increased irritation was produced, while in a smaller number of cases, elevation of mood was noted. Because of the inherent tendency of this group to improve it was difficult to estimate the effect of the drug. We feel that theoretically the drug is not suitable for use in severe states of depression because of our previous observations that the drug has less effect in elevating the mood than in producing acceleration of motor and speech activity.

For the past three years, selected patients have been treated with the combined amphetamine sulfate-sodium amytal treatment (c. f. dementia praecox, supra). This regime has been found to be suitable for mixed and for manic types as well as for depressed cases of manic depressive psychosis, and therefore it has been applicable to a larger group of patients. The preliminary results thus far obtained have been sufficiently satisfactory so that we believe that the combined therapy may eliminate some of the previously mentioned obstacles to the use of amphetamine sulfate alone in cases of this type.

Psychoneuroses: We encountered the greatest difficulty in evaluating the effect of amphetamine sulfate in psychoneurotics. Most striking was the lack of consistent improvement in all phases of response in any given case. Amelioration of the predominant psychoneurotic complaint was found in only a quarter of the cases. The results were for the most part transitory. Anxiety states are usually aggravated by the drug. For this reason, we use caution in administering the drug to persons with anxiety neurosis, involutional melancholia and mixed manic psychosis.

The present day psychiatrist does not believe that the entity termed chronic nervous exhaustion exists and we subscribe to that opinion. When underlying organic disease or excessive physical strain cannot be uncovered as a cause of persistent fatigability, a psychoneurosis exists. We have been unable to observe any more beneficial effect from amphetamine sulfate in cases falling in this category than in other psychoneuroses.

Specific Aspects
Behavior Disorders in Children

In our experience, amphetamine sulfate acts more paradoxically in children than in adults. It must, therefore, be given with greater caution. In functional behavior disorders, it was of little value, although it temporarily increased the inclination to do work, the coordination of activity and the general efficiency. We noted a tendency to lessened activity in about one third of our restless children when moderate doses were employed. Here, too, the effect was not permanent. Inability to concentrate and decreased alertness were sometimes observed. Some complained of excessive fatigue. Children with inherently low mental levels showed little alteration of intelligence scores after amphetamine sulfate.

However, children with syndromes associated with subcortical, extra-pyramidal, early organic, toxic or infectious disease seemed to become more alert when amphetamine sulfate was administered. An increase in their intelligence quotients was noted. Children with post-encephalitic Parkinsonism, early encephalitis lethargica, head trauma and birth trauma and those with double athetosis, Little's disease or dystonia muscularum showed some improvement. Great caution, however, must be used in the administration of the drug to these cases. Some cases of dullness and apathy associated with endocrine conditions, such as Froehlich's syndrome, cryptorchidism, hypothyroid or pituitary syndromes became more alert, particularly when the drug was given in conjunction with the proper hormonic treatment. In certain sluggish, obese children, increased alertness was brought about as well as weight reduction. A few cases with demonstrable hypathalamic

lesions showed improved performance and more activity.

In epileptic children the same considerations apply as were mentioned for adults. In some children with specific reading and speech difficulties, amphetamine sulfate seems to be of some value because it influences the general efficiency, motor and speech activities as well as the emotional reaction. It is useful, at times, in the treatment of enuresis. Many of these clinical applications in children require further confirmation. In children it is best to proceed with small doses, beginning with 2½ to 5 mg. and increasing the dosage gradually.

Miscellaneous Applications

The drug seems to have a favorable action in shock and hypnotension, migraine, myasthenia gravis (in combination with prostigmine), multiple sclerosis, asthma, persistent hiccough, vomiting of pregnancy and seasickness. We have found amphetamine sulfate effective in relieving the girdle-pains of gastric crises.

Resumé

(1) The psychiatric aspects of amphetamine sulfate therapy are discussed. (2) Contra-indications, precautions and untoward effects are outlined briefly. (3) The general, specific and miscellaneous indications are mentioned.

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Psychobiology

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ance from the time of birth to the onset of the illness. From this reconstruction of the illness as a part of the patient, in fact of his method of meeting life's problems, a formulation specific to this individual is derived. There is no attempt at nosological pigeonholing, no pedantic urge toward classification. The treatment for any disorder is dictated by the special demands of that particular patient with all the individualization which that implies, instead of a superficial routine application of some system. The prognosis likewise is not glibly given as a cliche but evaluated in relation to the specific patient; this avoids the pall cast by certain "diagnoses" which are associated with a "bad" prognosis, and encourages a healthy optimism.

We are fortunate in having a sane, balanced method available for the general practitioner in the treatment of psychiatric disorders. Psychiatry is now a part of medicine, employing the methods which have been justified in practical usage by the many physicians who have been treating the patient as well as the disease.

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NEWSNOTES

DIRECTORY OF MEDICAL SPECIALISTS

The Advisory Board of Medical Specialties has prepared the first edition of the *Directory of Medical Specialists* listing approximately 14,000 specialists certified by the twelve American Boards and the two affiliate boards in the Specialties.

This directory will have three sections. The first will be devoted to a brief discussion of the Advisory Board for Medical Specialties, its organization and objectives. The second section will have fourteen separate divisions, one for each American Board with a geographic and a detailed biographic listing of its Diplomates. Each of these divisions will give full information regarding requirements for admission to examinations for certification, details of organization of each Board, and other general information. The third and final section will be a complete alphabetic list of all 14,000 Diplomates, with their addresses and indications of specialty certification.

It is expected to issue the Directory every two years. No charge is made for any listing in the Directory, and only the names of the specialists certified by the American Boards will be included.

The Directory is to be the official publication of the Advisory Board for Medical Specialties and will be issued through the Columbia University Press in New York City. Plans for the Directory have been under way for nearly three years. It represents an effort officially to inform the lay and medical public regarding the present strong movement for certification of qualified medical specialists, and is expected to have wide use as a reference work in this respect.

Financial support has been given the Directory by the American Boards; the project is not designed to be profit-making, and the widest possible public distribution of the Directory is desired. On these accounts, the subscription price of the book has been set at a sum ($3.50 per copy) computed to cover only publication expenses.

The Directory should be invaluable to the entire medical profession in the reference of patients, as well as in many other ways, and the individual support of this new project of the American Boards is earnestly solicited by every Diplomate.

The Directory will be sold generally to physicians, libraries, hospitals, and others by subscription. Such subscriptions may be made through the Columbia University Press, 2960 Broadway, New York, N. Y., or through the office of the directing editor.

The editorial board consists of the secretaries of the fourteen American Boards. Dr. Paul Titus, 1015 Highland Building, Pittsburgh, Pa., Secretary of the Advisory Board, is the directing editor.

FAMOUS BRITISH PSYCHIATRIST VISITS THE UNITED STATES

Sir James Purves-Stewart, internationally famous British Neurologist visited his former pupil, Dr. Beverley R. Tucker, Richmond, Virginia. A number of Dr. Tucker's close friends were invited to meet Sir James, who is on his way back to England after delivering a series of lectures at Buenos Aires, Argentina.

Dr. Irving E. Charlesworth has been appointed medical director of the Napa State Hospital, Imola, California. He succeeds the late Dr. J. M. Scanland. Dr. Charlesworth has been a member of the hospital for thirteen years and he has served as assistant superintendent since 1932.

Dr. B. F. Peterson, assistant superintendent of Eastern State Hospital, Knoxville, Tennessee, has been named superintendent of Western State Hospital, Bolivar, Tennessee. He succeeds Dr. J. R. Wilson who resigned.

Dr. John A. Pritchard, superintendent of the Buffalo State Hospital, Buffalo, New York, has become superintendent of the St. Lawrence State Hospital, Ogdensburg, New York. He succeeds Dr. Paul G. Taddiken who has retired.

Dr. Raymond F. C. Kieb, superintendent of the Matteawan State Hospital for the Criminal Insane, Matteawan, New York, has been transferred to the Institution for Male Defective Delinquents at Napanoch, New York.

AMERICAN PSYCHIATRIC ASSOCIATION MEETS AT CINCINNATI

The annual meeting of the American Psychiatric Association will be held this year at Cincinnati, Ohio, May 20-24. Headquarters have been established at the Netherlands Plaza Hotel. Dr. Thomas A. Ratliff is the chairman of the Committee on Local Arrangements and Dr. Emerson A. North is Vice-Chairman.

AMERICAN ORTHOPSYCHIATRIC ASSOCIATION MEETS AT BOSTON

The American Orthopsychiatric Association will meet at Boston, Massachusetts, on February 22-24. Dr. C. La Mar of New York City, is the secretary of the Society.